CAPITA



Llantarnam 3G Pitch

Ground Investigation Report

September 2020

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Project No: CS/099476

CS/Doc Ref: 99479-CAP-75-XX-RP-GT-002

Rev: P01

Torfaen County Borough Council

Llantarnam 3G Pitch

Ground Investigation Report

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Issue Record

Rev	Date	Description/Comments	Author/Prepared by:	Approved for Issueby:
P01	10/09/20	First Issue	A. Thrower	A. Hale

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1. Introduction

1.1 Background

Torfaen County Borough Council (TCBC) propose to construct a new 3G pitch with a new car park area and associated footpaths. There are a number of options currently being considered including a single and double pitch option. The proposed development is to take place adjacent to the existing Llantarnam Community Primary School.

Capita Real Estate and Infrastructure (Capita) were commissioned to carry out a ground investigation at the site, and to prepare a Ground Investigation Report (GIR) of the scheme.

1.2 Report Objectives

The objectives of this GIR are to:

- Evaluate the ground conditions at the site;
- Recommend material parameters for input into the detailed design;
- Provide advice on other geotechnical aspects of the design;
- Determine potential contaminative status of the underlying soils; and
- Provide recommendations for further works, should they be required.

This report presents the results of the fieldwork undertaken and provides an interpretation of the factual information obtained and should be read in conjunction with the desk study for the site (Ref. 1).

1.3 Site Location and Description

The site is located on the southern side of Cwmbran, to the west of the existing Llantarnam Community Primary School, approximately 250m southwest of Llantarnam Road. The National Grid reference of the site is 330141, 193445. The location of this scheme is presented on Drawing 99476-CAP-75-XX-DR-C-7501 – Site Location Plan.

The site is currently used as sports playing fields. Its western boundary is marked by a line of trees and the northern boundary by a series of garden walls/fence lines associated with the residential properties in this area. The southern boundary is again marked by a line of trees, and the eastern boundary by the fence line marking the boundary with the primary school. Current vehicular access on to the proposed site area is via Llantarnam Community Primary School site. There is foot access from Court Farm Road but this is through privately owned land.

Dowlais Brook is located adjacent to the southwest corner of the proposed site area. From this location the brook flows southwards into a pond located adjacent to Lakeside Close and Llantarnam Park Way some 400m south southeast.



1.4 Proposed Works

Construction of the proposed scheme will include the following main components:

- Excavation of existing ground and installation of drainage;
- The laying of sub pitch formation and the "3G/4G" surface;
- Secure perimeter fence-line;
- Associated parking areas and pedestrian access routes; and
- Lighting columns.



2. Existing Information

2.1 Topographical Maps (Historical)

A review of the development at the site, using historical Ordnance Survey (OS) plans from 1882 to 2019 has been undertaken to study the history and development at this location.

A Preliminary Sources Study Report (PSSR) (Ref. 1) was undertaken for this scheme in June 2020. Relevant site maps and historical background were studied at that stage and the PSSR report should be read in conjunction with this report. Copies of the maps are presented within Appendix C of the PSSR.

2.2 Geological Maps and Memoirs

Published geological information (Refs. 2 to 4) indicates that the following stratigraphic sequence is present beneath the site:

2.2.1 Superficial Deposits

Made Ground

Although not indicated as being present on the geological maps covering the area, it is likely that some of the site area will be underlain by Made Ground or re-worked natural materials.

Natural Superficial Deposits

Three types of superficial deposits are indicated at the site. It is anticipated that residual deposits will be present, formed by the in-situ weathering of the underlying bedrock materials. In this area these would typically be expected to comprise soft to firm red clay/silt. The eastern side of the site is likely to encounter river terrace deposits, with the southern side alluvial materials. These are likely to range from clays to gravels.

2.2.2 Solid Geology

Raglan Mudstone Group

The solid geology beneath the site is indicated to be underlain by the Raglan Mudstone Group. This group comprises predominately mudstone with subordinate sandstone and limestone beds. The limestone is noted as being more common in the upper most "Psammosteus". In the former Gwent area, the Raglan Mudstone Group forms lower lying areas and weathers to a red heavy clay soil. In the Cwmbran area this group is between 550m and 610m thick. It consists of mudstone or silty mudstone usually reddish brown or purple in colour, with occasional green colouring as spots, irregular patches, stripes and tubes, or along margins of bedding and joint planes. It is poorly bedded and has an irregular blocky fracture. Mica flakes are commonly present, and particularly visible on bedding planes. It is this mineral which makes some sandstones soft and 'shalely' due to its abundance. A few lenticular sandstone beds are noted as being interbedded with the mudstone especially in the lower part of the sequence.



Calcareous deposits are common in the "Psammosteus" Limestone beds. Approximately 30m of strata contain both mudstone and limestone nodules which become more abundant up sequence terminating in the "Psammosteus" Limestone which is the most persistent limestone bed in the area and is used as a marker horizon.

2.2.3 Structural Geology

The dip of the strata in this area is variable, the closest recorded dip is indicated to be 20 degrees to the west.

2.2.4 Historical Boreholes

A number of historical boreholes in the area were identified on the British Geological Survey (BGS) borehole database. Four of these were between 30m and 131m from the site and provide an indication of the likely thickness of superficial deposits. These are summarised below.

Hole Reference Distance / Direction from site		Approximate thickness of superficial deposits
ST39SW351	60m / SW	3.0m
ST39SW311	131m / NE	4.5m
ST39SW350	40m / SW	4.5m
ST39SW339	20m / E	3.5m

Table 2.1: Summary of BGS Boreholes

2.2.5 *Hydrogeology*

Information of the hydrogeology of the site is available in the PSSR (Ref. 1). The pertinent details are summarised below:

- The underlying strata at the site are classified as a Secondary type-A Aquifer with a high groundwater vulnerability;
- The site is not within a Groundwater Source Protection Zone;
- The southern portion of the site is classified as an area of potential for groundwater flooding to occur at the surface;
- The northeast corner of the site is classified as having the potential for groundwater flooding of property below ground level; and
- The northern part of the site is unclassified.



2.2.6 Hydrology

Information of the hydrology of the site is available in the PSSR (Ref. 1). The pertinent details are summarised below:

• The southern portion of the site is classified as being at low to medium risk of surface water flooding.

Further details can be found in the PSSR document.



3. Field and Laboratory Studies

3.1 Ground Investigation

A suite of ground investigations was carried out at the site by Quantum geotechnical between 3rd and 9th June 2020. The ground investigation was planned, procured and supervised by Capita, with the purpose to provide information to facilitate the detailed design of the scheme.

3.1.1 Description of Fieldwork

The following exploratory operations were undertaken by Quantum Geotechnical:

- 15 No. Windowless Sample Boreholes with Dynamic Probes;
- 18 No. Hand Excavated Trial Pits;
- 2 No. Machine Excavated Trial Pits;
- Soakaway infiltration tests were carried out in the machine excavated trial pits;
- TRL-DCP probes were carried out adjacent to the hand excavated and machine excavated trial pits; and
- Sampling of soils for geotechnical and geo-environmental laboratory testing.

The location of the exploratory holes is shown on drawing: 99476-CAP-75-XX-DR-C-7504 - Exploratory Hole Location Plan.

3.1.2 Ground Investigation Factual Report

The results from the site investigation carried out by Quantum Geotechnical was received at the end of July 2020 and presented in their final report "*Llantarnam 3G Pitches – Ground Investigation Factual Report, Report No. Q0269/FR*" issued in August 2020 (Ref. 5) Contained in Appendix A.

3.1.3 Results of In-Situ Tests

The results of the in-situ testing are presented within the aforementioned contractor's factual report for the ground investigation. The results have been analysed and are discussed in Section 5, Material Properties.

3.2 Laboratory Testing

3.2.1 Geotechnical Testing

A programme of geotechnical testing was devised by Capita and conducted by the Quantum Geotechnical in-house laboratory and their sub-contractor laboratories, Geo Site Testing Ltd of Llanelli. The following tests (see Table 3.1) were undertaken on representative samples of soil. Copies of the geotechnical test results are presented in Appendix A.



Table 3.1: Details of Soil Testing

Soil Testing	Number of Tests
Moisture Content	15
Atterberg Test	15
Particle Size Distribution by Wet Sieve	5
Particle Size Distribution: Sedimentation by pipette	5
Dry Density / Moisture content 2.5kg rammer	2
CBR at each compaction point	2
Sulfate content of soil/ water extract	3
pH value	3
Acid Soluble SO ₄	3
Total sulphur	3

3.2.2 Geo-environmental Testing

Chemical testing was scheduled by Capita on samples taken from the exploratory holes. All of the geo-environmental laboratory testing was carried out at the Laboratories of Chemtest, Newmarket (UKAS accreditation number 2183). The results have been analysed and are discussed in Section 7, Land Contamination. Copies of the contamination test results are presented in Appendix A.



4. Ground Conditions

4.1 General

The ground investigation shows a simple geological sequence comprising topsoil overlying Superficial Deposits of clay, sand and gravel. Where present, Made Ground was overlying the natural superficial deposits. In general, the natural superficial deposits comprised an initial cohesive layer that was overlying the granular deposits. The table below summarises the thickness of the deposits encountered.

	Topsoil	Made Ground	Cohesive Superficial deposits	Granular Superficial Deposits (SAND)	Granular Superficial Deposits (GRAVEL)
Thickness (m)	0.01 to 0.25 [0.14]	0.10 to 1.15 [0.50]	0.30 to >2.90 [0.96]	0.30 to >1.70 [0.97]	0.30 to >2.10 [0.86]
Number of Holes Encountering material	29	26	30	6	7

Table 4.1: Summary of Deposits Encountered

[x] = average thickness (m)

The following sub-sections give an overview of the ground conditions encountered during the ground investigation.

4.2 Superficial Deposits

4.2.1 Topsoil

Topsoil was encountered in the majority of exploratory holes with thicknesses ranging between 0.01m and 0.25m. It was generally described as light brown, occasionally light grey, sandy silt, with 'many rootlets.'

4.2.2 Made Ground

Made Ground was encountered in 26 of the exploratory holes at thicknesses of between 0.10m to 0.15m. The composition of the Made Ground was consistent across the site where it was encountered. It is described as a light brown slightly sandy, slightly gravelly to gravelly silt. The gravel is fine to coarse, sub-rounded to angular of sandstone, mudstone and brick, with occasional glass, concrete and clinker. Some exploratory holes report a low to medium cobble content of sandstone.



4.2.3 Cohesive Deposits (Clay and Silt)

Underlying the Made Ground and Topsoil, cohesive superficial deposits were encountered across the site. The deposits were between 0.30m and >2.90m in thickness. The deposits are described as firm to stiff, reddish brown occasionally slightly sandy silty clay. Occasional pockets of silt are also noted on the logs. Gravel is occasionally recorded, but where it is, it is described as fine to coarse, angular to rounded mudstone and sandstone.

Thin layers, up to approximately 0.2m, of very clayey gravel are recorded in the exploratory holes TP19 and WS01, interbedded with the cohesive material.

4.2.4 Granular Deposits (Sand and Gravel)

Underlying the cohesive layers were granular deposits of sand and gravel. The sandy layers were encountered with thicknesses of between 0.30m and >1.70m. The material is described as reddish brown slightly clayey, slightly silty, slightly gravelly sand, or just clayey sand. The gravel is described as fine to coarse, angular to sub-rounded sandstone.

The gravel layers encountered underlying the cohesive deposits were recorded with thicknesses of between 0.30m and >2.10m. The material is described as light brown and grey sandy gravel. The gravel is described as fine to coarse, sub-rounded to angular of sandstone.

4.3 Solid Geology

Bedrock was not encountered during the ground investigation.

4.4 Groundwater

Water seepage was observed in 4 of the 35 exploratory holes undertaken at the site, as summarised in the table below.

Exploratory Hole	Seepage Details
TP19	Between 1.50m and 1.70m bgl
TP20	At 2.3m bgl
WS11	Below 2.0m bgl
WS12	Below 2.0m bgl

Table 4.2: Summary of Water Seepages



Groundwater and gas monitoring standpipes (50mm diameter) were installed in four of the completed window sample locations. Groundwater readings were obtained during three site visits and a summary is provided in Table 4.3 below.

			Obser	ved Grour	ndwater Le	vels	
Exploratory	Response zone	08/06/2020		09/06/2020		15/06/2020	
Hole ID	(m bgl)	mbgl	mOD	mbgl	mOD	mbgl	mOD
WS01	0.50 to 2.50	1.40	38.47	1.40	38.47	1.38	38.49
WS02	0.50 to 2.35	-	-	Dry	n/a	2.09	37.61
WS05	0.50 to 1.90	Dry	n/a	Dry	n/a	1.81	37.01
WS09	0.50 to 1.60	Dry	n/a	Dry	n/a	Dry	n/a

Table 4.3: Summary of Groundwater Observations During Monitoring

It should be noted that groundwater levels are subject to seasonal, diurnal and other effects and may at times differ to those measured during the investigation and subsequent monitoring visits.



5. Material Properties

5.1 Topsoil

Topsoil was encountered in the majority of exploratory holes and was recorded to a maximum thickness of 0.25m. No geotechnical parameters are presented for this material as it had limited thickness and will be stripped during the proposed development of the site. Topsoil stripped as part of the main works may suitable for reuse on the landscaped areas of the new development.

5.2 Made Ground

5.2.1 Undrained Shear Strength

The table below presents the results of in-situ super heavy dynamic probe (SHDP) testing undertaken in the Made Ground. The results have been presented showing the results for the number of blow counts per 100mm (N₁₀₀) and the number of blow counts per 300mm (N₃₀₀). The Made Ground was found to be typically cohesive in nature, and the results show the N₁₀₀ values were between 2 and 10, with an average of 6. The corresponding N₃₀₀ values, are between 12 and 24 with an average of 18.

Test Type	SHDP 'N' Value	No Tests	Min	Mean	Мах	Standard Deviation
SHDD	N 100	43	2	6	10	1.98
SHDP	N300	20	12	18	24	3.68

Table 5.1: Summary of Super Heavy Dynamic Probe Data

Notes: SHDP = Super Heavy Dynamic Probe

The N₃₀₀ value, albeit tentatively, can be directly correlated with the standard penetration test (SPT) N value, which in turn may be used to estimate undrained shear strengths of clay soils. Assuming a c_u/N ratio of 4.5 (following CIRIA 143, 1995) these results are indicative of an undrained shear strength of approximately between 54kPa and 108kPa with an average of 81kPa. With reference to table 9 of BS5930 (2015), these values imply a medium to high strength material, averaging high strength.

5.3 Natural Superficial Deposits

5.3.1 Classification Tests

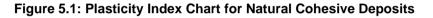
Moisture Content and Atterberg Limits

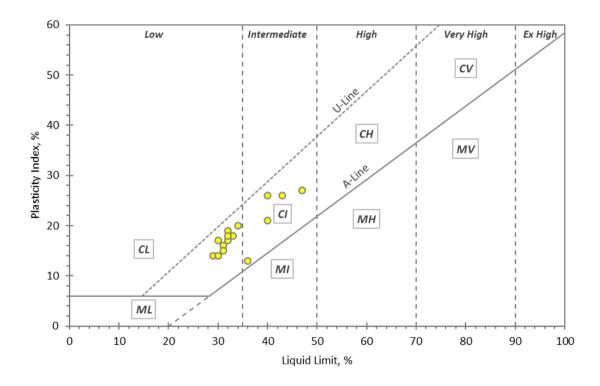
Atterberg limits and moisture content testing was carried out on fifteen samples of the natural cohesive soils. The results from the testing are summarised in Table 5.2 below.

Moisture Content w	Plastic Limit w _P	Liquid Limit w _∟	Plasticity Index I _P
(%)	(%)	(%)	(%)
11 to 23	13 to 23	29 to 47	13 to 27
(16) [15]	(16) [15]	(35) [15]	(19) [15]

(x) average; [x] nr samples

The Atterberg Limits test results carried out on the fifteen samples show the natural cohesive deposits to be predominantly of low to intermediate plasticity (Figure 5.1), with liquid limits ranging between 29% and 47% (Average 35%). Plastic limits ranged between 13 and 23% (Average 16%), with plasticity indices of between 13 to 27% (Average 19%).





The moisture contents measured from the fifteen samples range between 11% and 23%, with an average of 16%. Of the fifteen moisture content test results, six were below the corresponding plastic limit for the sample, with four at the corresponding plastic limit, and the remaining five test results above corresponding plastic limit of the individual sample. Test results show that the moisture content in the soil increases from ground level to approximately 1.20m below ground level, suggesting there may be a desiccated crust at the ground surface. These test results are summarised in Figure 5.2.

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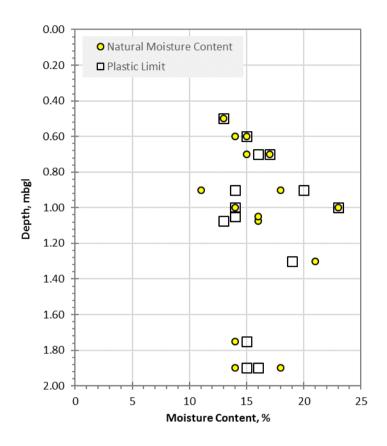
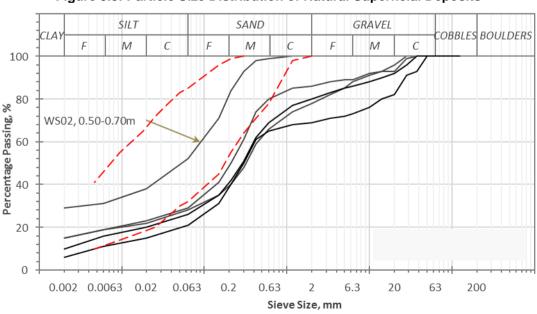


Figure 5.2: Moisture Content and Plastic Limit with Depth

Particle Size Distribution

The results of the particle size distribution tests are plotted collectively on Figure 5.3 below. Of the 5 number tests undertaken, all included a sedimentation analysis to quantify the fine content.







Of the 5 number tests undertaken in the natural superficial deposits, sample 1D in WS02 at 0.6m depth has a fines content of 52% (silt and clay fraction passing <0.063mm) implying the nature of the material is controlled by its fines content. The remaining 4 samples show the same general grading distribution with fines contents between 21% and 29% and appear to be mostly granular in nature with high gravel and sand contents. Cobble sized material was not encountered in the samples tested, but this does not exclude the possibility of cobble size material being present in the wider area.

Assessment of the material earthworks classifications indicate that the samples tested would generally classify as Grade 2A/2B or Grade 2C based on grading data alone. Frost susceptibility can be an issue for fine grained soils close to the ground surface. A frost susceptibility envelope has been plotted on the grading chart and indicates Sample 1D in WS02 may be frost susceptible. Constructing pavements on frost susceptible material may require greater thicknesses (>0.45m) for pavement foundations. A summary of the grading data is provided in Table 5.3.

Samples	HP12, 2B	WS02, 1D	WS03, 1B	WS11, B1	WS12, B2
Depth, m BGL	0.80 to 1.0	0.50 to 0.70	0.90 to 2.60	1.0 to 2.50	2.0 to 2.50
Fill classification	2A/2B	2A/2B	2C	2C	2A/2B
Cobbles, %	0	0	0	0	0
Gravel, %	14	0	22	31	20
Sand, %	57	48	50	48	54
Silt, %	14	23	13	15	16
Clay, %	15	29	15	6	10

Table 5.3; Summary of Sample Grading Proportions

5.3.2 Undrained Shear Strength

Super Heavy Dynamic Probe (SHDP) testing was undertaken in the natural superficial deposits. The results have been differentiated on the basis of cohesive and granular material types and presented showing the results for the number of blow counts per 100mm (N_{100}) and the number of blow counts per 300mm (N_{300}). The results are summarised in the table below.

Index Property	SHDP 'N' Value	No Tests	Min	Mean	Мах	Standard Deviation
SHDP	N 100	233	0	6	50	8.03
(Cohesive)	N300	201	1	17	87	13.98
SHDP	N 100	170	1	9	50	10.60
(Granular)	N ₃₀₀	150	6	21	96	16.34

Notes: SHDP = Super Heavy Dynamic Probe

Cohesive deposits were encountered between 0.20m and 4.30m below ground level, with scattered N_{100} values between 0 and 50, with an average of 6. The corresponding N_{300} values are between 1 and 87 with an average of 17. The N_{300} value, albeit tentatively, can be directly



correlated with the standard penetration test (SPT) N value, which in turn may be used to estimate undrained shear strengths of clay soils. Assuming a c_u/N ratio of 5 (following CIRIA 143, 1995) these results are indicative of an undrained shear strength of approximately between 5kPa and >250kPa with an average of 85kPa. With reference to table 9 of BS5930 (2015), these values imply an extremely low to very high strength material, averaging high strength.

The results from the granular deposits show N_{100} values of between 1 and 50, with an average of 9. The corresponding N_{300} results show values between 6 and 96 with an average of 21. Based on these values, Table 10 of BS5930 implies a relative density of loose to very dense, with an average relative density of medium dense.

5.3.3 Hand Vane Tests

A number of hand vane tests were carried out on the cohesive soils recovered during the excavation of the window samples. The results are summarised in Table 5.5.

	ID Test Depth, I mbgl		Strength, kPa			
Hole ID		No. Tests	Peak	Residual	Peak Mean	Corrected
WS05	0.5	3	79 – 82	13 - 24	80	64
WS07	1.5	2	115 - 118	0 - 16	107	86
WS12	1.5	3	90 - 95	12 - 16	92	74
WS13	1.5	2	45 - 47	5	46	37
WS15	1.5	3	45 - 50	6 - 8	47	38

Table 5.5: Summary of Hand-Held Vane Tests Undertaken in Window Samples

Note: corrected values derived from a correction factor of 0.8 in accordance with Bjerrum (Figure 1.3, Tomlinson, 1996)

With reference to Table 9 of BS5930 (2015), these values imply a medium to high strength soil, averaging medium strength.

5.3.4 Effective Shear Parameters

Estimates of the drained strength of the materials has been assessed by the relationship between the friction angle and plasticity given in BS8002 (Ref. 8) and by Kenney 1959 (Ref. 9). Based on an average plasticity value of 19% a critical angle of internal friction of 26° is indicated to be appropriate (based on BS8002) and peak angle of 30° (based on Kenney).

Considering the Mohr – Coulomb strength envelope can be expected to be curved sharply downwards at zero effective stress, it is considered that a small component of cohesion of 3 to 5kPa can be used in conjunction with the friction angle.



5.3.5 Consolidation

Settlement characteristics have been estimated from the relationship between the coefficient of volume compressibility and SPT 'N' values established by Stroud (Ref. 6). Based on the plasticity characteristics of the soils and the average N value of 17 recorded in the materials an m_v value of 0.12m²/MN is obtained.

$$m_v = \frac{1}{f1N} = \frac{1}{0.50 \times 17} = 0.12 \text{ m}^2\text{MN}$$

5.3.6 Groundwater

Groundwater seepages were encountered within the natural superficial deposits during the ground investigation works. Details regarding the monitoring of groundwater levels at the site are discussed in Section 4.4.

5.3.7 Summary of Material Design Parameters for natural superficial soils

Based on the analysis of laboratory and in situ test results and past experience with similar soils, the following characteristic soil parameters are recommended for use in design.

Stratum	Unit Weight (४) kN/m ³	Effective Cohesion (c') kPa	Effective friction Angle (φ') Degrees	Undrained Shear Strength (c _u) kPa	Coefficient of Compressibility (m _v) m ² /MN
Made Ground	19	unknown	unknown	55 - 80	unknown
Natural Superficial Deposits	19	unknown	26	25 - 75	0.12

Table 5.6: Summary of Characteristic Geotechnical Parameters



6. Geotechnical Considerations

6.1 Spread Foundations

Spread foundations will be required for the lighting columns. The bearing resistance of spread footings has been estimated using analytical methods and formulae outlined in Eurocode 7 Annex D for total stress (undrained) conditions. This assessment is tentative and based on the soil properties alone and no allowance has been included for loading from any proposed lighting column structure or bending moments from wind load effects. Further detailed assessment will need to be undertaken at a later stage once details for the proposed lighting column structure are known.

Using this method and the characteristic undrained shear strength parameters given for the superficial deposits discussed in section 5.4, the following soil bearing resistances are indicated to be available:

		Level of	Unit Bearing Resistance (kPa)		
Footing Size	Foundation Stratum	foundation base (mbgl)*	DA1C1	DA1C2	
Square Pad (2.2m to 2.4m)	Clay	Assumed 1m	250	190	

Table 6.1:	Summarv	of Unit	Bearing	Resistances
	Gammary		Dearing	Resistances

*mbgl = metres below existing ground level (prior to works).

The net allowable unit bearing resistances quoted in Table 6.1 are for a maximum total settlement of 25mm and founding within the underlying superficial deposits.

Additionally, it is recommended that;

- 150mm of compacted engineered fill (Type 1 sub-base) is placed beneath the lighting mast foundation bases.
- Formation to be inspected by a competent person prior to placing sub-base.
- Any soft spots encountered at formation are to be removed and backfilled with compacted engineered fill to the satisfaction of the engineer.

6.2 Protection of Buried Concrete

The requirement for protecting concrete from aggressive ground is determined from BRE Special Digest 1: Concrete in Aggressive Ground, 2005 (Ref. 10). Based on the testing results of 3 samples, Aggressive Chemical Environment for Concrete (ACEC) classification of AC-1d and a Design Sulphate Class DS-1 class appears to be appropriate for this site.



6.3 Pavement design

Nineteen TRL Dynamic Cone Penetration (DCP) tests were undertaken adjacent to each Hand Pit and machine excavated Trial Pit location (Appendix A). An indicative California Bearing Ratio (CBR) value is obtained from a relationship between CBR and the DCP readings, as derived by the Transport Research Laboratory. Data recorded indicates that at a minimum depth of 0.5mbgl, a CBR value of 3 to 4% is available based on the lower bound values.

Any soft spots uncovered at formation to be removed and backfilled with compacted engineered fill to the satisfaction of the engineer. In-situ verification CBR tests to be undertaken by the contractor at formation, number and location to be confirmed by the supervising engineer.

6.4 Swelling and shrinkage of clay

The tendency of clay to shrink and swell is linked to the type and amount of clay particles in the soil. These are quantified in index tests to determine the plasticity, specifically the Plasticity Index (PI) which is the difference between the Liquid and Plastic Limits. Plasticity Index represents the range of moisture contents over which a soil is plastic (i.e. it can be deformed without volume change). By calculating the modified PI it can be compared to the Volume change potential chart provided by the NHBC guidance on Foundations (Section 4.2) (Ref. 11).

Based on these recommendations, the volume change potential of the natural superficial deposits is considered low, with average Modified PI Values of below 20%.

6.5 Permeability

During the ground investigation, 2 No. soakaway tests were undertaken at the site in the machine excavated trial pits. Both recorded insufficient outflow to calculate permeability. Therefore the use of a soakaway drainage design would not be recommended at the site. Copies of the infiltration test results are presented in Appendix A.

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7. Land Contamination

7.1 Conceptual Site Model and Environmental Risk Assessment

The Preliminary Sources (Desk) Study (Ref. 1) contains the desk study information upon which the Preliminary Conceptual Site Model is based. It also contains a preliminary environmental risk assessment that provides a qualitative assessment of the risks associated with the identified plausible pollutant linkages.

7.2 Preliminary Risk Assessment

Based on the CSM the following table presents the plausible pollutant linkages that apply to this site in the developed scenario. An indicative qualitative assessment of the likelihood that a risk could be realised is provided with Table 7.1 below, constituting the Preliminary Risk Assessment (PRA) as outlined in CLR 11 (Ref. 12).

Potential Receptor	Potential Source	Potential Pathways	Preliminary Risk
Construction workers	Contaminated Soil (road / parking / loading / storage / manufacturing areas).	Dermal contact and direct ingestion of soils, inhalation of vapors and asbestos particles, ingestion of windblown dust.	Low
End Users	Contaminated Soil (road / parking/ loading / storage / manufacturing areas).	Dermal contact and direct ingestion of soils, inhalation of vapors and ingestion of windblown dust.	Low
Adjacent Site Users	Contaminated Soil (road / parking/ loading / storage / manufacturing areas).	Inhalation of vapors and ingestion of windblown dust.	Low
Controlled Waters - Groundwater	Contaminated Soil (road / parking / loading / storage / manufacturing areas). Contaminant release during construction (fuel leak etc.)	Release during construction of contaminates from soil or by direct release from plant (fuel / hydraulic leak/ spillage etc.)	Low
Controlled Waters – Rivers	Contaminated Soil (road / parking / loading / storage / manufacturing areas). Contaminant release during construction (fuel leak etc.)	Release during construction of contaminates from soil or by direct release from plant (fuel / hydraulic leak/ spillage etc.)	Low

Table 7.1: Summary of the Preliminary Risk Associated with Potential Pollutant Linkages



7.3 Investigation Strategy

Hand pit and window sample boreholes were positioned to gather information below the footprint of the proposed 3G pitch, associated access tracks and parking areas, and the lighting columns.

7.4 Laboratory Testing

7.4.1 Geo-environmental Testing

Chemical testing was scheduled by Capita on samples taken from the exploratory holes. All of the geo-environmental lab testing was carried out at the Laboratories of Chemtest in Newmarket (UKAS accreditation number 2183).

Table 7.2: Details of Geo-environmental Testing

Type of Test	Number of Tests
Suite E Soil	8
Suite F Water	2
Suite K Soil Leachate	3

Various determinands tested within are presented in tables 7.3 to 7.5.

Table 7.3: Chemical Testing Suite E1 (Soil)

	Suite E – Soil						
Metals	Non- Metals	ТРН	VOCs	SVOCs			
Arsenic	Inorganic Cyanide	Aliphatic C6- C10	Benzene SGV	Benz[a]anthracene			
Boron		Aliphatic C10-21	Chloroethene	Benzo[a]pyrene			
Cadmium		Aliphatic C21-40	1,2-Dichloroethane	Benzo[b]fluoranthene			
Chromium VI			Ethylbenzene SGV	Benzo[ghi]perylene			
Copper			Naphthalene	Benzo[k]fluoranthene			
Lead			Tetrachloroethanes	Chrysene			
Mercury			Tetrachloroethene	Dibenz[ah]anthracene			
Nickel			Tetrachloromethane	Fluoranthene			
Selenium			Toluene SGV	Indeno[123-cd]pyrene			
Zinc			1,1,1-Trichloroethane	Naphthalene			
			Trichloroethene	Phenol SGV.			
			Xylenes SGV	Pyrene			



Table 7.4: Suite F Water

Analytical Parameter (Water Analysis)	Analytical Parameter (Water Analysis)
Benzene	Arsenic as As (Dissolved)
Ethyl Benzene	Cadmium as Cd (Dissolved)
m/p Xylenes	Chromium as Cr (Dissolved)
Ammoniacal Nitrogen as N	Copper as Cu (Dissolved)
Chloride as Cl w	Lead as Pb (Dissolved)
Nitrate as N	Mercury as Hg (Dissolved)
Benzo-a-Pyrene	Nickel as Ni (Dissolved)
Chrysene	Zinc as Zn (Dissolved)

Table 7.5: Suite K (Leachate)

Analytical Parameter (Soil Analysis)	Analytical Parameter (Soil Analysis)
Arsenic (aqua regia extractable)	Nickel (aqua regia extractable)
Barium (aqua regia extractable)	Selenium (aqua regia extractable)
Berilium (aqua regia extractable)	Vanadium (aqua regia extractable)
Boron (aqua regia extractable)	PAH Speciated (USEPA16
Cadmium (aqua regia extractable)	TPH banded (C6 - C40)
Chromium (aqua regia extractable)	VOC's
Copper (aqua regia extractable)	SVOC'S
Lead (aqua regia extractable)	рН
Mercury (aqua regia extractable)	Total Phenols HPLC (monohydric)

7.5 Visual / Olfactory Signs of Contamination

During the ground investigation, no visual and olfactory signs of contamination were noted on the exploratory hole log sheets.

7.6 Generic Quantitative Risk Assessment - Human Health

This analysis compares the measured concentrations of contaminants within soils, as revealed by laboratory test results, with Generic Assessment Criteria (GAC) values appropriate to the proposed end-use.

The methodology for the derivation of the GAC values is presented in 'The LQM/CIEH S4ULs for Human Health Risk assessment' * (Ref. 13) with the exception of lead which in the absence of other authoritative guidance is that presented in SP1010 (Ref. 14).

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7.6.1 Method of Analysis – Soil Contamination

The GAC are used for preliminary screening purposes only. If a concentration of a determinant is less than the corresponding S4UL/C4SL and the assumptions of the generic land-use are appropriate to the site conditions, it is reasonable to assume the concentration poses an 'acceptable' level of risk to human health, within the context of Part 2A. However, where a determinands concentration exceeds the corresponding GAC value, it does not necessarily indicate an unacceptable risk; it indicates a need for further investigation/assessment and/or inclusion of appropriate mitigating measures during the design and construction phases of a development. It should be noted that construction workers are not included in this GQRA as acute exposure conditions, such as those encountered during the construction process, are not considered when deriving the GAC. The contractor should read this environmental assessment in order to satisfy himself that suitable health and safety precautions are put in place for his employees and the public during the works period.

The GQRA has been carried out to establish the risk to end users of the proposed development. The proposed end use in this case is a 3G sports pitch. In this case we have interpreted the 'Public Open Space (public park)' generic land-use as described in Ref. 13, to be suitably close to representing the characteristics of the proposed development.

There are a variety of surface soils present at the site which have been tested and revealed a wide range of soil organic matter (SOM) content. Consequently the GAC used are those derived for 'Sand' with 1 % SOM, this represents a worst-case scenario.

Laboratory test results have been analysed in the GQRA using the statistical methods outlined in Ref. 15.

7.6.2 Analysis of Results

The site has been analysed in terms of two distinct strata layers.

- Made Ground; and
- Natural superficial deposits.

The results of the GQRA are summarised below and presented in full within Appendix B.

7.6.2.1 Made Ground

Inorganic and Organic Chemistry

Of the five samples of Made Ground tested, no GAC exceedances were recorded for inorganic or organic determinands. No asbestos fibers were recorded.

Total Petroleum Hydrocarbons (TPH)

All of the results for Made Ground were below the LoD for TPH.



7.6.2.2 Natural Superficial Deposits

Inorganic and Organic Chemistry

For the six samples of natural superficial deposits, no GAC exceedances were recorded for any inorganic or organic determinands. No asbestos fibres were detected.

Total Petroleum Hydrocarbons (TPH)

All of the results for Made Ground were below the LoD for TPH.

7.6.3 Leachate Testing

Leachate testing is a useful indicator of the potential mobility of contaminants. In order to provide an indication of contaminant mobility, two samples of Made Ground were tested for Suite E2, leachable contaminants, and one sample of the natural superficial deposits. The results were screened as for a Tier 1 controlled waters GQRA using the GACs for UK Drinking Water Standards (DWS) or Environmental Quality Standard (EQS) value, which are generally very stringent target concentrations (Appendix B).

The pH of the samples for Made Ground ranged from 7.2 to 7.6, indicating slightly alkaline conditions. The pH for the one sample of natural superficial deposits was 8.8 having a slightly greater alkalinity than the Made Ground.

One sample of Made Ground and one sample of natural superficial deposits returned concentrations of Copper (dissolved) and Lead (dissolved) above the DWS limit.

7.6.4 Groundwater Testing

Two water samples that were collected from standpipes installed in window sample were tested. The results indicate levels of Arsenic (dissolved), Chromium (dissolved), Copper (dissolved), Nickle (Dissolved) and Boron (dissolved) were elevated above the GAC for DWS.

7.6.5 Conclusions of Soil GQRA

None of the soil samples tested recorded levels of organic or inorganic contaminants above their corresponding GAC value.

Leachate testing recorded levels of copper and lead in the Made Ground and natural superficial deposits which exceeded the DWS limit. It should also be noted that laboratory leachate tests are relatively aggressive, often over estimating contaminant concentrations and may not realistically represent actual conditions.

Groundwater testing indicates that a number of metals were found at levels that exceeded the GAC for drinking water standards (DWS).

7.7 Generic Quantitative Risk Assessment - Ground Gas

The Conceptual Site Model identified Made Ground as a potential source of ground gas and vapours at the site. The GI methodology permitted the installation of four 50 mm diameter combined groundwater and gas-monitoring pipes into window sample boreholes. A single round of ground gas monitoring was undertaken on 15/06/2020 in all four of the standpipes. The results are summarised in the table below.

Hole ID	Flow L/hr	CH₄ %	CO2 %	O2 %	CO ppm	H₂S ppm
WS01	0.0	0.0	3.0	18.4	0.0	0.0
WS03	0.0	0.0	3.0	19.4	0.0	0.0
WS05	0.0	0.9	4.2	11.6	0.0	0.0
WS09	0.1	0.0	1.5	19.3	0.0	0.0

Table 7.6: Summary of Ground Gas Readings

The results show that methane was recorded in WS05 at a concentration of 0.9%. Carbon dioxide was encountered in all the installations at concentrations between 1.5% and 4.2%. The lowest value of oxygen, 11.6% corresponds to WS05, which had the highest recording of carbon dioxide. The only flow that was recorded was in WS09 at 0.1 L/hr. Copies of the gas monitoring results are presented in Appendix A. Carbon monoxide and hydrogen sulphide were not detected.

Based upon this preliminary information, there appears to be a risk to the development from elevated levels of ground gas. This may be mitigated, however, by the nature of the works not requiring entry into deep excavations. This issue should be raised with the contracting firm undertaking the final works and incorporated into risk assessments going forward.



8. Updated Conceptual Site Model

8.1 Overview

This section summarises the findings of the recent ground investigation and presents an updated Conceptual Site Model.

The salient points determined by the ground investigation are:

- The ground conditions across the site are reasonably consistent, the sequence of which comprises:
 - o Topsoil;
 - Made Ground; and
 - Natural Superficial Deposits.
- The Made Ground and underlying clay soils was relatively uncontaminated with no GAC exceedances or elevated concentrations of contaminants significantly above natural background concentrations (for 'Public Open Space' land use);
- Asbestos was not detected in any of the samples;
- Groundwater seepages were encountered in trial pits TP19 and TP20, and window samples WS11 and WS12 between 1.5mbgl and 2.7mbgl. Subsequent groundwater monitoring in standpipes installed in window samples WS01, WS02, WS05 and WS09 found that they were often dry (See table 4.1). WS01 had a water level of approximately 1.40m bgl on all three monitoring visits. WS02 and WS05 showed water levels of 1.80 and 2.10m bgl on the one visit they contained water. WS09 was consistently dry.
- Leachable concentrations of soil contaminants were generally low, with only copper and lead exceeding the corresponding GAC value.
- Testing of groundwater samples showed elevated levels of Arsenic (dissolved), Chromium (dissolved), Copper (dissolved), Nickle (Dissolved) and Boron (dissolved) exceeding the corresponding GAC values.
- Gas monitoring was undertaken on two occasions and revealed elevated concentrations of carbon dioxide with depleted levels of oxygen. Low levels of methane was also recorded in WS05. Typically, there was no associated flow with the results although 0.1L/hr was recorded in WS05.

8.2 Conceptual Site Model

The identified sources of contamination, the receptors in the developed scenario and the plausible pollutant linkages between them, are discussed below.



8.2.1 Contamination Sources

Post GI, the identified contamination sources are:

- Leachates in the form of metals; and
- Ground gas and vapours.

8.2.2 Receptors

The potential receptors identified in the developed scenario are:

8.2.2.1 Human Health

The Client proposes to use the site as a 3G pitch (playing field) for a school. Given this proposed end use, the human health receptors are:

- School children, staff and associated adults.
- Construction workers.

8.2.2.2 Controlled Water

The site is underlain by a Secondary A type aquifer. Six water abstractions have been granted within 1km of the site. The closest is 632m to the east of the site.

8.2.2.3 Property

Geotechnical and structural considerations are dealt with in section 6 of this report.

8.2.2.4 Eco-Systems

There are no sites with statutory protection in the immediate vicinity.

8.2.3 Plausible Pollutant (Contaminant) Linkages

The plausible contaminant linkages for the site is presented as Table 8.1 below. The pollutant linkages described below assume that the site will be developed for a 3G/4G pitch.



Receptor	Source	Pathway	Preliminary Risk
Future Site Users & Site Staff	Contaminated Soil Including Asbestos Fibres	Dermal Contact / Particulate Inhalation / Ingestion	Very Low
	Gas and Vapours Methane, Hydrocarbons and Carbon Dioxide	Inhalation	Low
Construction Workers	Contaminated Soil Including Asbestos Fibres	Dermal Contact / Particulate Inhalation / Ingestion	Low
	Gas and Vapours Methane, Hydrocarbons and Carbon Dioxide	Inhalation	Low

Table 8.1: Plausible Pollutant Linkages

8.2.4 Risk Evaluation

Potential risks are summarised in Table 8.1 above and are discussed in the following sections.

8.2.4.1 Construction Workers

During the ground works and construction phase of the development there is a risk of harm arising from the short-term exposure to contaminants through handling of impacted soils, dust generation and asbestos fibre liberation from bare ground and stockpiles, and vapours accumulating in trenches. It is noted, however, that asbestos was not recorded during the GI works.

Although these short-term risks are not quantified in the GQRA, the developer should use the GI data to assess the risks to the work force (and adjacent site occupiers). Risk mitigation measures must be identified in the construction phase health and safety plan and consequently implemented on site during the works.

Similar risks may occur where maintenance, repair or refurbishment involves excavation of the ground in the finished development.

Elevated levels of carbon dioxide ground gas were recorded during the monitoring of the installations with depleted levels of oxygen.

8.2.4.2 Users of Proposed Development

The human health GQRA identified the Made Ground and underlying sandy gravelly clay stratum as generally uncontaminated. Furthermore, once the construction works have been completed the site will be capped by the 3G/4G pitch, reducing the risk of end users being exposed to any contaminated soils.



9. Material Re-Use and Disposal

If any form of excavation is required then the designer has a duty to determine whether any of the materials encountered could be hazardous.

Any material removed from site will be subject to waste management regulations and these should be adhered to. The following section provides information on waste classification for disposal purposes and options for recycling.

The majority of excavated materials are likely to comprise topsoil and Made Ground of mixed lithologies. These materials are likely to be suitable for use as general fill and landscaping.

Soil classification for the natural superficial deposits soils underlying the topsoil and Made Ground indicate this material to be 'Class 2A/2B and 2C –Cohesive Material'. If any materials are to be reused for engineering purposes, then confirmation of its classification will need to be undertaken on representative samples prior to use.

A waste classification has been undertaken utilising HazWasteOnline. Seven samples of Made Ground and three sample of the underlying natural material were assessed utilising chemical test data obtained from the GI. The Waste Classification data is presented in Appendix C. The assessment determined the Made Ground and underlying natural ground to be non-hazardous.

Any materials being removed from the site will need appropriate testing by the contractor at the time of removal / disposal.

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Llantarnam 3G Pitch Ground Investigation Report September 2020

10. Geotechnical Risk Register

10.1 General

During ground investigation and subsequent geotechnical analysis of the area, certain geotechnical risks have been identified. Potential risks for the project have been assessed using a simple scale points system using the relationship:

Table A					
Probability (P)					
Category Definition					
Expected (>10%)	Likely to occur frequently, many times during the project	5			
Probably (1-10%)	Several times during project period	4			
Possible (0.1-1%)	Sometime during project period	3			
Improbable (0.011%)	Unlikely but possible in project period	2			
Remote (<0.01%)	Very unlikely to occur at all	1			

Risk Rating R = Probability	(P) x Consequence (C)
-----------------------------	-----------------------

l able B						
Consequence (C)						
Category	Category Definition					
Catastrophic	Multiple deaths, total loss of system	5				
Serious	Major damage, death	4				
Significant	Partial failure, serious injury	3				
Minor	Minor damage/injury	2				
Negligible	Can be regarded as without consequence	1				

Table D

Table C

Level of Risk (R)				
Risk Rating	Category	Guidance		
20-25	Very High	Intolerable, must be eliminated or avoided		
11-19	High	Unacceptable, must be eliminated or avoided		
7-10	Moderate	Undesirable, to be avoided if reasonably practical		
3-6	Low	Acceptable – can be accepted provided risk is managed		
1-2	Very Low	No remedial action is necessary		



The potential risks and impact on the overall scheme are summarised in the Table 10.1 below:

Facture	Geotechnical		Initial Risk Rating				
Feature	Risk/Outcome	L	S	R	Category	Mitigation	
Underestimation of Contamination Level	Increased cost / delay in works. Treatment and/or disposal required.	2	3	6	Low	Implementation of site waste management plan.	
Pavement foundations	Subgrade CBR value less than anticipated. Increase in cost of capping/pavement.	2	2	4	Low	Review pavement design. Consider some form of improving subgrade soils. Visual inspection on site. Confirm CBR value by on site testing.	
Spread Foundations	Excessive settlement of strata beneath shallow foundations. Bearing failure.	2	3	6	Low	Adequate initial site investigation and design. Foundations designed to reduce settlement to within allowable tolerances. Visual inspect of formation material to confirm ground conditions. Excavate and replace zone of soft material with suitable selected granular material.	
Chemical attack on concrete structures	Structural deterioration.	2	3	6	Low	Selection of appropriate concrete class for construction of foundation structures.	

Table 10.1: Geotechnical Risk Register



11. Conclusions and Recommendations

11.1 Conclusions

• The geology encountered can be summarised as below:

Strata	Description
Topsoil (Made Ground)	Light brown, occasionally light grey, sandy silt
Made Ground	Light brown slightly sandy, slightly gravelly to gravelly silt. The gravel is fine to coarse, sub-rounded to angular of sandstone, mudstone and brick, with occasional glass, concrete and clinker. Some exploratory holes report a low to medium cobble content of sandstone.
Natural Superficial Deposits	Cohesive deposits of firm to stiff, reddish brown occasionally slightly sandy silty clay. Occasional pockets of silt are also noted on the logs. Gravel is occasionally recorded, but where it is, it is described as fine to coarse, angular to rounded mudstone and sandstone.
	Granular layers comprising reddish brown slightly clayey, slightly silty, slightly gravelly sand, or just clayey sand; and light brown and grey sandy gravel. The gravel is described as fine to coarse, sub-rounded to angular of sandstone

Table 11.1 Summary of Encountered Geology

- Human health considerations were assessed in relation to potential contamination. Samples
 were tested for metals and non-metals, volatile and semi volatile organic compounds, and
 total petroleum hydrocarbons. The assessment carried out indicates that the values for soils
 were below the GAC for "'Public Open Space (Public Park)" end use and therefore present
 a low risk to human health for that land use.
- Asbestos was not detected in the samples tested.
- There is considered to be a low ground gas generation potential at the site. Based on the current available information the risk of harm to the proposed development is considered to be low.
- Groundwater monitoring in standpipes installed in window samples WS01, WS02, WS05 and WS09 found that they were often dry (See table 4.1). WS01 had a water level of approximately 1.40m bgl on all three monitoring visits. WS02 and WS05 showed water levels of 1.80 and 2.10m bgl on the one visit they contained water. WS09 was consistently dry.



11.2 Recommendations

- Asbestos was not encountered in the samples tested, but consideration of its presence is advisable in any remediation strategy.
- Based on the results of the site investigation, laboratory and in situ testing, reference to technical literature and past experience with similar materials, the characteristic soil parameters in the Table 11.2 are recommended.

Unit Weight (४) kN/m ³	Effective Cohesion (c') kPa	Effective friction Angle (φ') Degrees	Undrained Shear Strength (c _u) kPa	Coefficient of Compressibility (m _v) m ² /MN
Made Ground	19.8	unknown	unknown	55 - 80
Natural Superficial Deposits	19.8	3 - 5	26	25 - 75

Table 11.2: Summary of Characteristic Geotechnical Parameters

Any proposed spread foundation will be placed within the natural superficial deposits. The bearing resistance of such footings has been determined as outlined in Eurocode 7 Annex D (total stress conditions) and summarised in Table 11.2 below. The net allowable unit bearing resistances quoted in Table 11.2 are for a maximum total settlement of 25mm and founding within the underlying natural superficial deposits. This assessment is tentative only and based on the soil properties alone and no allowance has been included for loading from any proposed lighting column structure or bending moments from wind load effects. Further detailed assessment will need to be undertaken at a later stage once details for the proposed structure are known.

Table 11.3: Summary of Unit Bearing Resistances

		Level of	Unit Bearing Resistance (kPa)		
Footing Size	Foundation Stratum	foundation base (mbgl)*	DA1C1	DA1C2	
Square Pad (2.2m to 2.4m)	Clay	Assumed 1m	250	190	

*mbgl = metres below existing ground level (prior to works).

• Additionally, it is recommended that where the lighting mast foundation bases are proposed, 150mm of compacted engineered fill (Type 1 sub-base) is placed beneath the foundation.



Commercial in Confidence 11/ Conclusions and Recommendations

- The formation to be inspected by a competent person prior to placing sub base, and any soft spots encountered at formation are to be removed and backfilled with compacted engineered fill to the satisfaction of the engineer.
- Data recorded indicates that at a minimum depth of 0.5mbgl, a CBR value of 3 to 4% is available based on the lower bound values.
- Any soft spots uncovered at formation to be removed and backfilled with compacted engineered fill to the satisfaction of the engineer. In-situ verification CBR tests to be undertaken by the contractor at formation.
- Soakaway testing at two locations recorded insufficient outflow to calculate permeability. Therefore, the use of a soakaway drainage design would not be recommended at the site.
- Based on the testing results an Aggressive Chemical Environment for Concrete (ACEC) classification of AC-1d and a Design Sulphate Class DC-1 class appears to be appropriate for this site.



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12. References

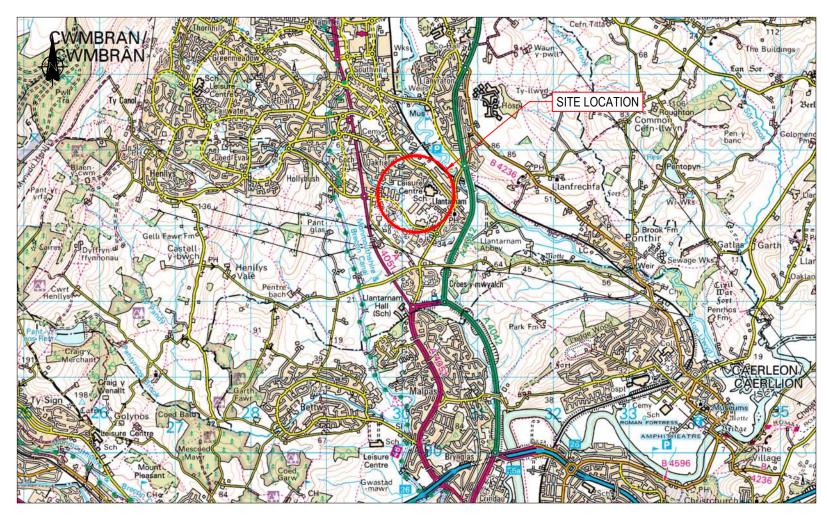
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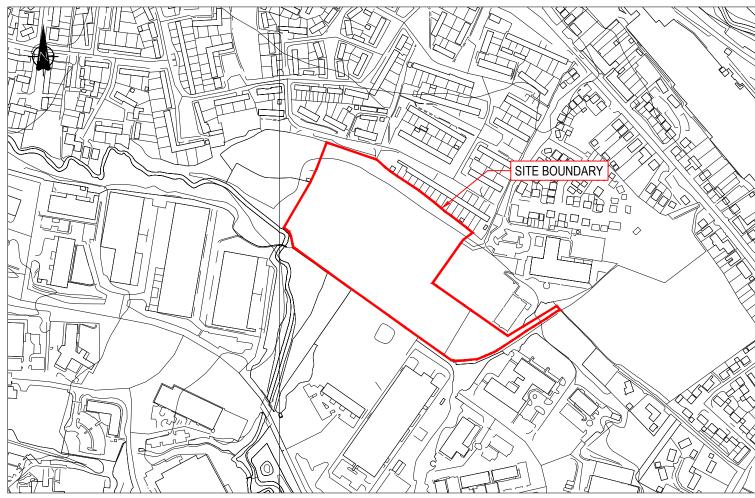
DRAWINGS

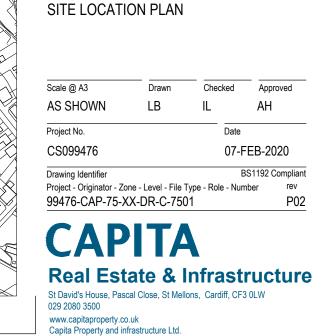
Drawings

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SCALE - 1:50,000





LLANTARNAM 3G PITCHES

Project

Drawing

Client TORFAEN COUNTY BOROUGH COUNCIL

COMMERCIAL IN CONFIDENCE

S2 - FIT FOR INFORMATION

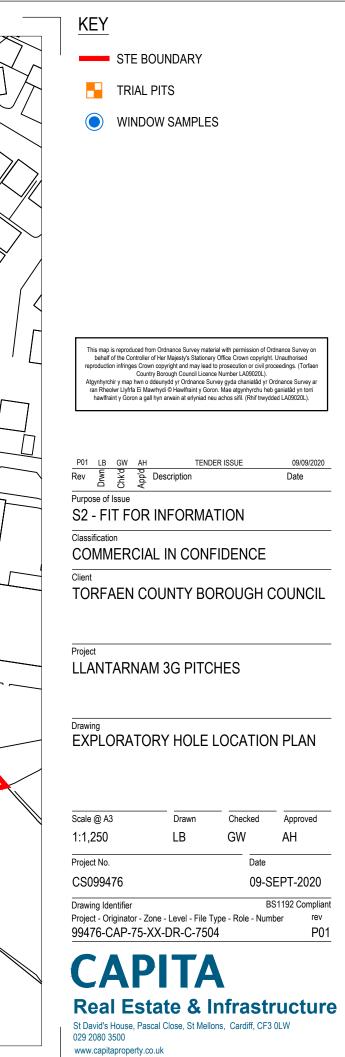
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Purpose	of	Issue

Classification

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Rev	Drwn	Chk'd	App'd	Description	Date
P01	LB	IL	AH	TENDER ISSUE	24/02/2020
P01	LB	GW	AH	REPORT ISSUE	07/09/2020

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APPENDIX A

Appendix A Quantum Ground Investigation Factual Report

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Llantarnam 3G Pitches

GROUND INVESTIGATION FACTUAL REPORT

Report No. Q0269/FR

August 2020

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Contract Name:	LLANTARNAM 3G PITCHES
Contract Reference:	Q0269
Report Type:	Factual Ground Investigation Report
Report Reference:	Q0269/FR
Date of Report Production:	August 2020
Client	Torfaen County Borough Council

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Disclaimer: Quantum Geotechnic Limited has prepared this report in accordance with the instructions of the above named Client for their sole and specific use. Any third parties who may use the information contained herein do so at their own risk.



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0.0. FOREWORD

The following Conditions and Notes on Site Investigation Procedures should be read in conjunction with this report.

0.1. Ground Investigation

0.1.1. General

Recommendations made and opinions expressed in the report are based on the strata observed in the boreholes and excavations, together with the results of site and laboratory tests. No responsibility can be held for conditions which have not been revealed by the Exploratory Holes or which occur between them. Whilst the report may suggest the likely configuration of strata, both between Exploratory Holes and below the maximum depth of investigation, this is only indicative and liability cannot be accepted for its accuracy.

Unless specifically stated, no account has been taken of possible subsidence due to mineral extraction below or close to the site.

0.1.2. Investigation Procedures

Widow Sampling and Trial Pitting techniques for ground investigation have been employed within the project. All Exploratory Hole operations, sampling and logging of soils, rocks and in-situ testing complies with the recommendations of the British Code of Practice BS 5930 (2020), 'Site Investigations', British Code of Practice BS 10175: 2011 +A1:2013 'Investigation of Potentially Contaminated Sites' and BS 1377: 1990, 'Methods of Test for Soils for Engineering Purposes'. Whilst these techniques allow the maximum data to be obtained in soft ground/ superficial deposits, some disturbance and variation of soft and layered soils is unavoidable. Attention is drawn to this condition whenever it is suspected.

0.1.3. Routine Sampling

Representative disturbed and environmental soil samples of the different strata are taken following completion of logging. Soil samples obtained for testing are sampled and sealed in plastic tubs, borosilicate amber jars or in specialist vessels where required. All samples are returned from site to QGL's laboratory for controlled storage within 24 hours of sampling to await test scheduling/requirements.

0.1.4. In-Situ Testing

- Hand Shear Vane
- Soakaway testing
- Dynamic Probes
- DCP/TRL Probes

0.1.5. Groundwater

Where possible, the depth of entry of any influx of groundwater is recorded during the course of excavation or boring operations. The rate of inflow into the excavation or borehole is monitored during the course of the excavation or during boring procedures. Upon encountering any water strikes, work is temporarily halted and the water levels monitored for a standard twenty-minute period recording the change in water level at the end of the twenty minutes.

Groundwater conditions observed in the excavations are those appertaining to the period of investigation. It should be noted, however, that groundwater levels are subject to diurnal, seasonal and climatic variations and can also be affected by drainage conditions or other causes.

0.1.6. Retention of Samples

After satisfactory completion of all the scheduled laboratory tests on any sample, the remaining material is discarded. Further to notifying the Engineer/ Client with one week's notice all soil and/or rock samples will be discarded 28 days after submission of the approved final report.



1.0. INTRODUCTION

1.1 General

Upon the instructions of Capita (Project Engineer / Investigation Supervisor), on behalf of Torfaen County Borough Council (Client), Quantum Geotechnic Ltd (QGL) has been commissioned to undertake a ground investigation on land to the west of the existing Llantarnam Community Primary School site, located some 250m to the south west of Llantarnam Road, Llantarnam, Cwmbran, for the proposed installation of a 3G pitch and associated infrastructure. The purpose of this ground investigation is to determine the existing ground and groundwater conditions on the site to allow the design to proceed.

The approximate Ordnance Survey National Grid Reference of the site is 330173, 193422.

This report presents a factual account of the fieldwork carried out, the strata encountered, groundwater observations and details subsequent laboratory testing undertaken on samples obtained from the investigation.

Other available sources of information that have been consulted include the published geological maps for the area.

General notes on the techniques employed by QGL are described in the Foreword together with the limitations inherent in carrying out site investigation work.



2.0. SITE DETAIL

2.1. Site Description

The ground investigation was undertaken across the site as directed by the Project Engineer / Investigation Supervisor. The site is currently a disused sports playing field and is generally flat with the exception of the strip of land close to the northern site boundary, which slopes up from south to north. Its western boundary is marked by a line of trees and the northern boundary by a series of garden walls associated with the properties in this area. The southern boundary is again marked by a line of trees/bushes, and the eastern boundary by the fenceline marking the boundary of the Llantarnam Community Primary School.

Dowlais Brook is located adjacent to the south west corner of the proposed site area. From this location the brook flows southwards into a pond located adjacent to Lakeside Close and Llantarnam Park Way some 400m south south east.

A site location plan can be found as Figure 1 in Appendix I.

2.2. Statutory Service Information

All service information was held by the Project Engineer and was made available to QGL prior to commencement of the intrusive works. Standard QGL procedures for breaking ground were followed and all areas were CAT scanned for presence of buried services.



3.0. GEOLOGY & ENVIRONMENTAL SETTING

3.1. Published Geology

Details of the superficial and solid geology of the site are provided by the British Geological Survey (BGS) Sheet 249 Newport (Solid and Drift) at 1:50,000 scale.

Superficial Geology

The geological sheet indicates the natural superficial deposits on the eastern side of the site is likely to be River Terrace deposits, with the southern side mapped to be underlain by Alluvial materials typically comprising of clays to gravels.

No Made Ground deposits are mapped across the site. There is however a possibility Made Ground may be present relating to the historic use / re-profiling of the site.

Solid Geology

The Geological map indicates the solid geology below the site to comprise of the Moor Cliff's Formation. This group comprises predominately mudstone with subordinate sandstone and limestone beds. The limestone is noted as being more common in the upper most Chapel Point Limestone Member.



4.0. FIELDWORK

4.1. General

The fieldwork was undertaken between the 3rd to the 9th June 2020. Full time on site supervision and attendance was provided by an Engineering Geologist from QGL.

All service plans were held onsite, with all site personnel inducted by QGL and briefed of the pertinent Risk Assessments and Method Statements relating to the tasks to be undertaken.

Each area of investigation was fully CAT ('Cable Avoidance Tool') scanned prior to breaking ground.

Summary of Fieldworks

The fieldworks comprised;

- 18 No. Hand Excavated Trial Pits
- 2 No. Machine Excavated Trial Pits
- 15 No. Window sample holes with dynamic probes
- Soakaway tests within the Machine Excavated Trial Pits
- TRL DCP Probes adjacent to each Trial Pit
- Sampling of soils for environmental and geotechnical testing

General notes on the techniques employed by Quantum Geotechnic are described in the Foreword together with the limitations inherent in carrying out ground investigation work.

4.2. Exploratory Hole Locations

The exploratory hole locations were set out by QGL in liaison with the Project Engineer. The exploratory hole locations were surveyed upon completion using a Leica dual frequency GPS Model 1250, accurate to 0.005m horizontal and 0.01m vertical.

A site location plan is presented as Figure 2 in Appendix I. The Exploratory Hole co-ordinates and levels are detailed within Table 1.



Table 1: Exploratory Hole Co-Ordinates & Levels

Exploratory Hole	Exploratory Hole Easting Northing Hei		
ID	Easting	Northing	Height (mAOD)
HDTP01	330234.372	193451.967	40.561
HDTP02	330155.889	193509.345	41.146
HDTP03	330067.577	193537.687	40.428
HDTP04	330031.811	193436.849	39.853
HDTP05	330071.17	193402.82	39.313
HDTP06	330198.449	193323.667	38.394
HDTP07	330257.672	193317.759	37.757
HDTP08	330344.534	193326.641	40.312
HDTP09	330231.915	193331.024	38.145
HDTP10	330184.232	193348.409	38.391
HDTP11	330111.135	193389.201	39.01
HDTP12	330157.302	193403.216	38.638
HDTP13	330199.638	193449.951	39.175
HDTP14	330112.667	193504.539	39.505
HDTP15	330077.548	193459.996	39.386
HDTP16	330054.528	193427.783	39.419
HDTP17	330197.026	193377.072	38.575
HDTP18	330241.849	193436.211	40.213
TP19	330076.623	193522.958	39.807
TP20	330202.449	193338.089	38.337
WS01	330092.272	193525.757	39.869
WS02	330054.254	193476.627	39.77
WS03	330041.572	193436.178	39.696
WS04	330088.196	193398.888	39.171
WS05	330118.097	193432.568	38.817
WS06	330171.713	193476.133	39.315
WS07	330211.581	193461.583	40.36
WS08	330225.59	193455.844	40.458
WS09	330233.376	193447.493	40.363
WS10	330191.755	193381.107	38.49
WS11	330164.868	193352.169	38.435
WS12	330205.344	193361.134	38.309
WS13	330222.881	193348.205	38.244
WS14	330191.825	193358.812	38.348
WS15	330213.795	193322.96	38.279



4.3 Trial Pits

2 No. Trial Pits (HDTP19-20) were excavated using a JCB 3CX excavator. 18 No. Trial Pits (HDTP01-18) were excavated using insulated hand tools at the positions shown on the exploratory hole location plan in Appendix I.

This method of investigation allows direct sampling of the near surface deposits for identification purposes, as well as assessment of any salient features and Made Ground or disturbed ground. The trial pits were logged in accordance with BS5930:2015; BS EN ISO 14688-1:2002 and BS EN ISO 14688-2:2004, and supervised at all times by an Engineering Geologist from QGL.

All trial pits were backfilled with compacted layers of arisings upon completion.

Geotechnical and Environmental samples were taken within the superficial deposits for laboratory testing purposes.

Details of the Trial Pits, including final depths in metres below ground level (mbgl) are provided in Table 2.

Exploratory Hole ID	Exploratory Hole Type	Final Length (mbgl)	Reason for termination
HDTP01	Hand Excavated Trial Pit	1.2	Specified depth
HDTP02	Hand Excavated Trial Pit	1.2	Specified depth
HDTP03	Hand Excavated Trial Pit	1.2	Specified depth
HDTP04	Hand Excavated Trial Pit	1.2	Specified depth
HDTP05	Hand Excavated Trial Pit	1.1	Unable to progress
HDTP06	Hand Excavated Trial Pit	1.1	Unable to progress
HDTP07	Hand Excavated Trial Pit	1.0	Unable to progress
HDTP08	Hand Excavated Trial Pit	1.1	Unable to progress
HDTP09	Hand Excavated Trial Pit	1.1	Unable to progress
HDTP10	Hand Excavated Trial Pit	1.15	Unable to progress
HDTP11	Hand Excavated Trial Pit	1.15	Unable to progress
HDTP12	Hand Excavated Trial Pit	1.2	Specified depth
HDTP13	Hand Excavated Trial Pit	1.2	Specified depth
HDTP14	Hand Excavated Trial Pit	1.1	Unable to progress
HDTP15	Hand Excavated Trial Pit	1.2	Specified depth
HDTP16	Hand Excavated Trial Pit	1.2	Specified depth
HDTP17	Hand Excavated Trial Pit	1.1	Unable to progress
HDTP18	Hand Excavated Trial Pit	1.2	Specified depth
TP19	Machine Excavated Trial Pit	2.7	Soakaway test undertaken
TP20	Machine Excavated Trial Pit	2.4	Soakaway test undertaken

Table 2: Trial Pit Detail



A complete set of Engineering Geologist's Test Hole logs are presented within Appendix II.

4.4 Windowless Sample Boreholes

A total of 15 No. Windowless Sample Boreholes (WS01-WS15) were undertaken during the site works. Windowless Sampling techniques involve a sampler dynamically driven down to depth using sampling tubes, nominally 116mm in diameter and reducing as depth increases. This technique allows a relatively undisturbed sample of soil to be taken in a plastic liner, or alternatively sub sampled as a disturbed jar sample. Within competent granular-cohesive soils the portable equipment used for Windowless Sampling is limited by the nature of the ground and robustness of the driving tool. The recovered sample liners were subsequently split and logged on site in accordance with BS5930: 2015; BS EN ISO 14688-1:2002 and BS EN ISO 14688-2:2005, by a Quantum Engineering Geologist. Each Windowless Sample location was reinstated with Bentonite and surface replaced as per pre-existing construction.

The sequence of deposits encountered during the investigation is detailed within the Engineering Geologist's logs presented within Appendix III. The logs highlight the nature of the soils encountered and provide descriptions of the strata revealed at the site. Details of the Windowless Sample Boreholes, including final depths in metres below ground level (m.bgl) are provided below in Table 3:

Exploratory Hole ID	Terminated Depth (m.bgl)	Reason for Termination
WS01	3.00	Encountered Refusal in gravelly Clay – unable to progress
WS02	1.20	Encountered Refusal in cobbles – unable to progress
WS03	2.60	Encountered Refusal in gravelly Sand – unable to progress
WS04	1.60	Encountered Refusal in sandy Gravel – unable to progress
WS05	1.90	Encountered Refusal in sandy Gravel – unable to progress
WS06	2.00	Encountered Refusal in gravelly Clay – unable to progress
WS07	1.80	Encountered Refusal in gravelly Clay – unable to progress
WS08	1.60	Encountered Refusal in gravelly Clay – unable to progress
WS09	1.60	Encountered Refusal in gravelly Clay – unable to progress
WS10	1.80	Encountered Refusal in sandy Gravel – unable to progress
WS11	2.50	Encountered Refusal in gravelly Sand – unable to progress
WS12	3.00	Encountered Refusal in gravelly Sand – unable to progress
WS13	2.00	Encountered Refusal in gravelly Sand – unable to progress
WS14	1.5	Encountered Refusal in sandy Gravel – unable to progress
WS15	4.00	Encountered Refusal in sandy Gravel – unable to progress

Table 3: Windowless Sample Borehole Detail

A complete set of Engineering Geologist's Window Sample borehole logs are presented within Appendix III.



4.5 In-Situ Testing

4.5.1 Super Heavy Dynamic Probe

To complement the findings of the Windowless Sample Boreholes, each Borehole was accompanied by a Super Heavy Dynamic Probe (DPSH) test immediately adjacent.

Super Heavy Dynamic Probe testing involves recording the blow counts for every 100mm of driving (N₁₀₀), using the automated 63.5kg drop hammer. Dynamic probing determines the resistance of soils in-situ to the intermittent penetration of a 90° cone when driven dynamically in a standard manner, a continuous record is provided with respect to depth of the resistance of the cone. The test is performed in accordance with BS EN ISO22476-2:2005+A1:2011 *Geotechnical Investigation and Testing. Field Testing. Dynamic Probing.* The information submitted is recorded as the number of blows to drive the cone each 100mm increment. Table 4 below details the depths that were achieved within the Super Heavy Dynamic Probes.

Exploratory Hole ID	Terminated Depth (m.bgl)	Reason for Termination
DP01	2.70	Refusal
DP02	2.20	Refusal
DP03	2.60	Refusal
DP04	2.80	Refusal
DP05	3.80	Refusal
DP06	2.50	Refusal
DP07	3.80	Refusal
DP08	4.10	Refusal
DP09	4.20	Refusal
DP10	1.90	Refusal
DP11	2.70	Refusal
DP12	4.20	Refusal
DP13	3.20	Refusal
DP14	1.60	Refusal
DP15	4.30	Refusal

Table 4: Super Heavy Dynamic Probe Test Detail

A complete set of Dynamic Probe test results are presented in Appendix IV.



4.5.2 TRL DCP Probes

The TRL (Transport Research Laboratory) Dynamic Cone Penetrometer (DCP) tests were undertaken adjacent to each Trial Pit. The TRL DCP probe is used for rapid in-situ measurement of the structural properties of existing shallow ground conditions. The unit incorporates an 8 kg weight with a drop of 575 mm, and a 20 mm diameter cone fitted to the end of the shaft, allowing measurements to be made down to a depth of approximately 850 mm.

The TRL DCP Probe results are presented in Appendix V.

4.5.3 Soakaway Tests

Soakaway tests were undertaken within Trial Pits TP19 and TP20 in accordance with BRE 365. The test involves filling a test pit with water and measuring the time taken for the water level to drop.

The Soakaway test results are presented in Appendix VI.

4.6. Sampling - General

Sampling of soils was undertaken in accordance with the Specification for the Works as specified by the Engineer. Geotechnical bulk, large bulk and disturbed samples were taken where required within the superficial deposits for strata identification and laboratory testing purposes. In addition, environment samples were taken in amber jars for laboratory testing.

All geotechnical samples are returned from site to QGL's laboratory for controlled storage to await test scheduling/requirements. For specific details of laboratory testing see Section 5.0. Sample type and sample depth are recorded on the Engineering Geologist's Exploratory Hole Logs found within Appendices II and III.

4.7 Gas and Groundwater Monitoring

A 50mm ID gas and groundwater standpipes was installed within WS01, WS03, WS05 and WS09 in accordance with the Engineer's instruction.

Table 5 details the installation.



Table 5: Monitoring Installation Details

Exploratory Hole ID	Installation Diameter (m.bgl)	Installation Depth (m.bgl)	Installation Response Zone (m.bgl)
WS01	50mm	2.5	0.5-2.5
WS03	50mm	2.35	0.5-2.35
WS05	50mm	1.9	0.5-1.9
WS09	50mm	1.6	0.5-1.6

Groundwater monitoring was undertaken during the fieldworks and ground gas and water monitoring along with groundwater sampling was undertaken upon completion of the fieldworks. The results are presented within Appendix VII.

Gas monitoring was undertaken using a GA2000 gas analyser to measure the following:

- Atmospheric pressure
- Flow rates (L/hr)
- Methane
- Carbon Dioxide
- Oxygen
- Carbon Monoxide
- Hydrogen Sulphide



5.0. LABORATORY TESTING

5.1 General

The laboratory testing was scheduled by the Project Engineer / Investigation Supervisor and comprised a number of geotechnical and environmental tests on selected soil, soil leachate and groundwater samples obtained during the investigation.

5.2 Geotechnical Laboratory Testing

All the geotechnical soil testing work was carried out in accordance with the procedures stipulated in the various sections of BS 1377:1990 Parts 1 - 9 Methods of test for soils for civil engineering purposes. Table 6 details the tests undertaken.

Table 6: Geotechnical Tests Undertaken

Type of Test	No of Tests
Moisture Content	15
Liquid Limit, Plastic Limit & Plasticity Index	15
PSD Wet Sieve	5
PSD Sedimentation by pipette	5
Dry density / moisture content relationship using 2.5kg rammer	2
CBR at each compaction point	2

Results of the geotechnical testing undertaken are presented within Appendix VIII.



5.3 Geoenvironmental Laboratory Testing

Geoenvironmental testing was carried out on selected soil and soil leachate samples gained from the ground investigation. The purpose of the testing is to gain a holistic view of any raised levels of contaminants that may exist onsite. Table 7 details Geo-Environmental tests undertaken on selected soil samples.

Type of Test			No of Tests			
	pH in 2.5:1 wate	er / soil extract				
Suite D (Soil)	SO4 in 2.5:1 wat		11			
	Acid Solu					
	Total Si Boron Water Soluble	Chromium VI				
	Arsenic	Phenols HPLC				
	Barium	Cyanide Total				
	Beryllium	Thiocyanate				
	Cadmium	pH				
	Chromium	Sulphur Total				
	Copper	Sulphide Acid Soluble				
Suite E (Soil)	Iron	Moisture Content	8			
	Lead	Soil organic matter				
	Mercury Nickel	PAH Speciated (USEPA 16) TPH banded (C6 – C40)				
	Selenium	VOCs				
	Vanadium	SVOC				
	Zinc	Asbestos Screen				
uite D (Soil) uite E (Soil)	Sulphate Soluble 2:1 extract					
	Boron Water Soluble	Sulphate (total)				
	Arsenic	Chromium VI				
	Boron (water soluble)	Phenols HPLC				
	Barium Beryllium	Cyanide Total Thiocyanate				
	Cadmium	pH				
Suite F (Water)	Chromium	Sulphur Total				
	Hexavalent Chromium	Sulphide				
Suito E (Mator)	Copper	Fraction Organic Carbon	2			
Sulle I (Waler)	Dissolved Organic Carbon	PAH Speciated (USEPA 16)	2			
	Iron	TPH banded (C6 – C40)				
	Lead Mercury	VOCs SVOC				
	Nickel	Hardness – Total (as				
	Selenium	CaCO3)				
	Vanadium	BOD				
	Zinc	COD				
	Leachate Preparation*	Sulphate (total)				
	pH	Sulphide				
	Ammonium as NH4	16 EPA Speciated Polycyclic				
	Arsenic	Aromatic Hydrocarbons				
	Boron (water soluble) Cadmium	Total Petroleum Hydrocarbons (>C10-C40)				
	Chromium (total)	BTEX (benzene, toluene,				
	Hexavalent Chromium	ethylbenzene & xylenes)				
Suite K (Sail Laachata)	Copper	Phenols (total monohydric)	3			
Suite N (SUII Leathale)	Lead	Leachate Preparation*	3			
	Mercury	pH				
	Nickel	Ammonium as NH4				
	Zinc Selenium	Arsenic Boron (water soluble)				
	Vanadium	Cadmium				
	Cyanide (free)	e saman				
	Cyanide (total)					

Results of the geoenvironmnetal / chemical testing undertaken are presented within Appendix IX.



6.0. REFERENCES

British Geological Survey: -

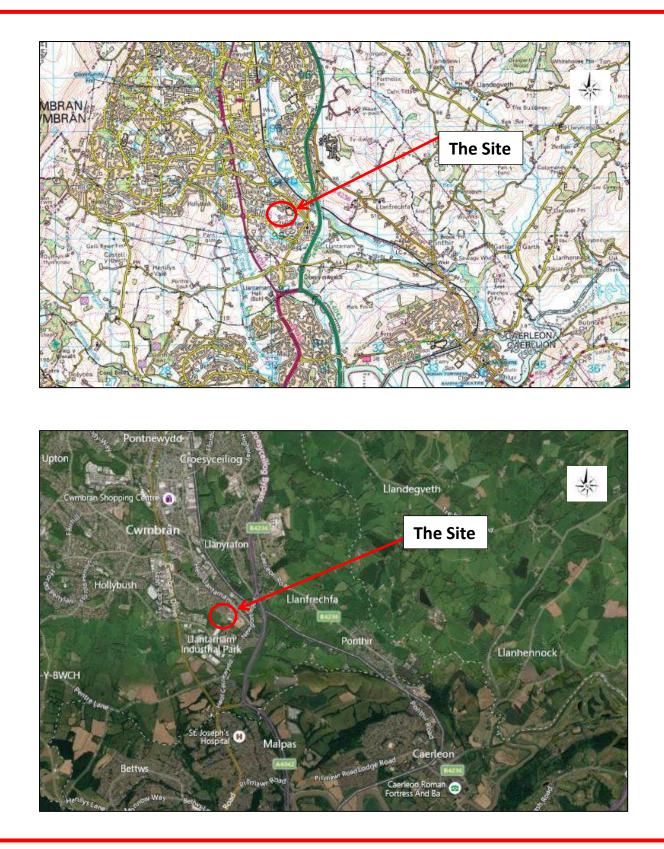
• Geological Sheet 249 Newport Drift and Solid editions at 1:50 000 scale.

Specialist Publications;-

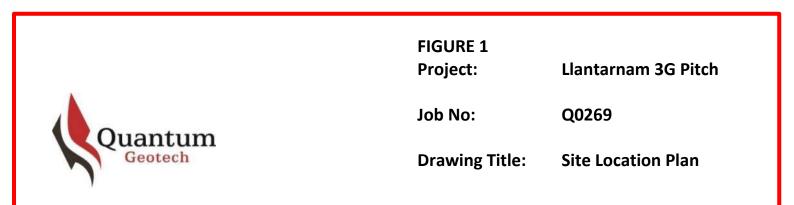
- British Code of Practice BS 5930: (2015) 'Code of Practice for Site Investigations'
- British Code of Practice BS 1377: (1990) 'Methods of test for soils for civil engineering purposes'.
- British Code of Practice BS EN ISO 14688-1:2002+A2:2013 Geotechnical investigation and testing.
- British Code of Practice BS EN ISO 14688-2:2004+A2:2013 Geotechnical investigation and testing.
- Identification and classification of soil. Principles for a classification.
- Health and Safety Executive Guidance Note EH40/90

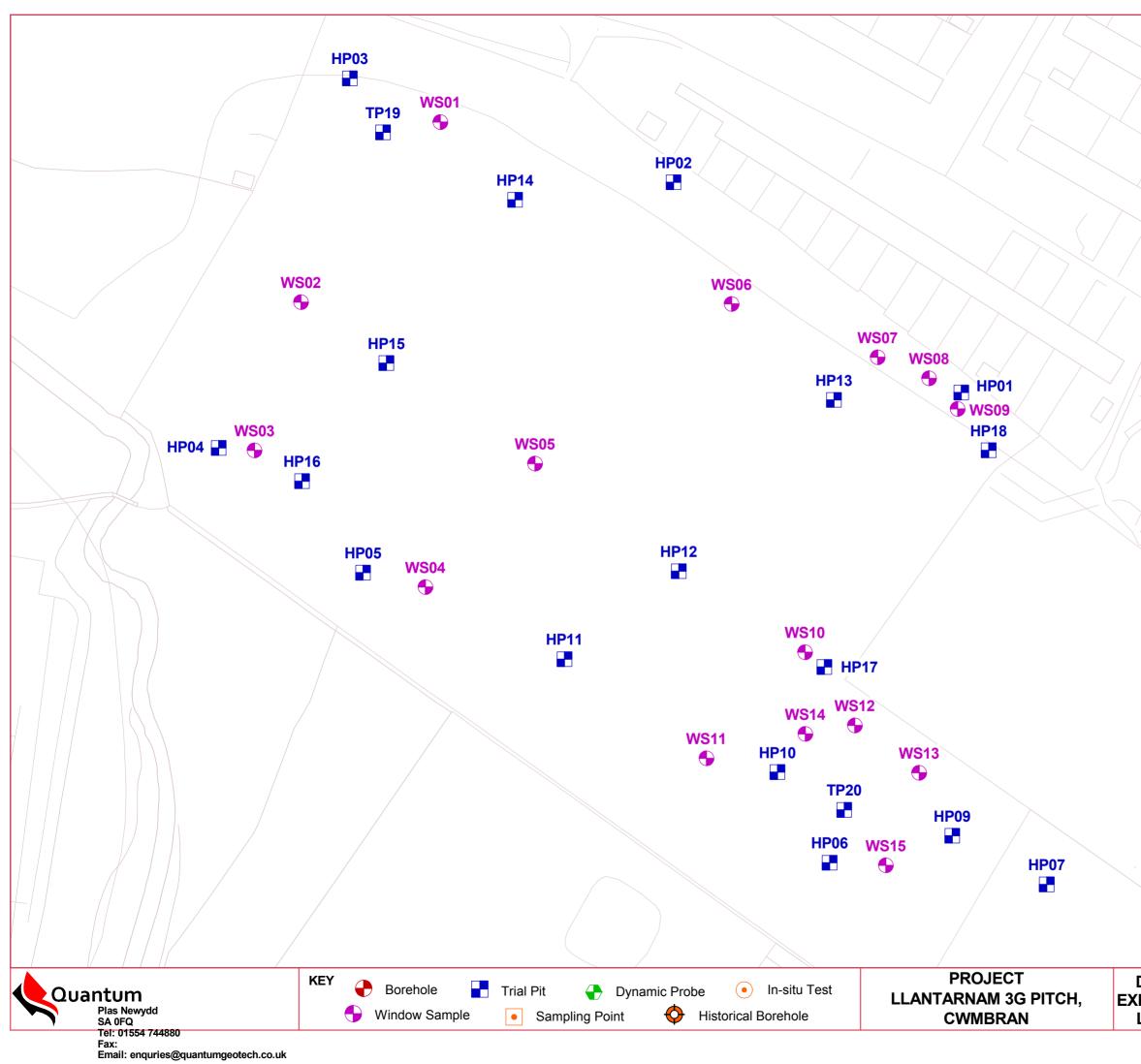


APPENDIX I – SITE PLANS



Mapping sourced from www.bing.com





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DRAWING TITLE:	JOB NO.	FIGURE NO.
PLORATORY HOLE	Q0269	2
LOCATION PLAN	DATE 10/07/20	SCALE 1:1000
	10/01/20	1.1000



APPENDIX II – ENGINEERING GEOLOGIST'S TRIAL PIT LOGS

Contract: Llantarnam 3G Pitch, Cwmbran												l Pit N	0.
C	lient : To	orfaer	Count	ty Borough	Counc	il					F	IP01	
	ntes : 3/6/2					300 Number . Q0203			Leve	40.56 m A.O.D. Level to Ordnance Datum			
Lo	ocation : W	Vithin p	laying fi	eld	Enginee	er : Capita		Coord	dinates:	330234 19345	1.97 N	ational Grid	J
Т.	Samp	les		Tests	Strata			Strata		Co-orain	iales lo N	ullonal Grid	
m B.G.L.	Depth	Type No.	Depth	Test Results	Depth (Thick- ness)		Descri	ption		L	.egend	Red. Level A.O.D.	WATER
						TOPSOIL - Light brown SILT with many rootlets						-	
-	-	-	-		0.20								
	_		_		0.20	Firm to stiff light	orangeish brow	/n SILT / CLA	Y	×, 1×	 	40.36	
-	-	-	-		-					- X- -			
-	- 0.50 -	- D1	_		- 0.60					(×			-
-	-	ES1	-		-					X - *	 	-	
-	-	-	-		-								
-	0.80 - 1.00	⁻ B1	-		0.80	Firm orangeish b	prown slightly sa	andy slightly g	gravelly SILT	·/ ×	<u>×_</u>	39.76	
-	-	-	-		-	CLAY. Gravel is	fine to coarse a	angular Muds	tone.	- *- ×			
-1	- 1.00 -	- ES2	_		- 0.40						∝ ★ 、	-	
-	-	-	-		-					× T R	X		
-	-	-	-		1.20	Terminated at 1.	2mbgl			· =	. <u>×~</u>	39.36	
PL	AN		Gro	oundwater: No G	Broundwate	r Encountered		Remarks :					
	 4 0.6 	<u> </u>	Sta	bility:									
C	D.6 D ▼ C	В	Sh	oring:									
Equ	upment Used:												
	0		Plas N SA4 0	ewydd FQ 554 744880		Operator:	Logged By.	Sheet No.	m Per	All measure	ements in		
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Contract: Llantarnam 3G Pitch, Cwmbran								
Client: Torfaen County Borough	Council		HP01					
Dates : 3/6/20 - 3/6/20	Job Number : Q0269		0.56 m A.O.D. evel to Ordnance Datum					
Location : Within playing field	Engineer : Capita	193	234.37 E 451.97 N rrdinates to National Grid					



Plas Newydd SA4 0FQ Tel: 01554 744880 Fax: ernail: enquiries@quantumgeot	Operator:	Logged By.	Sheet No. 2 Of 2	m Per Page	All measurements in metres unless otherwise stated	AGS
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Form Name: TP LOG. Version 2.11.000, 22/05/15 Output By: SteffPicton. Library File: C:USERS/PUBLIC/DOCUMENTS/BENTLEY/GINTLIBRARIES/QUANTUM 4.GLB.

Contract : Llantarnam 3G Pitch, Cwmbran											Trial Pit No.		
C	lient : To	o rfae r	n Count	ty Borough	Counc	il					ł	IP02	
	ates : 3/6/2					mber : Q0269			nd Level :	Le		lnance Dai	tum
Lo	cation : W	Vithin p	olaying fi	eld	Enginee	er : Capita		Coord	linates:	1935	55.89 E 09.35 N		ı
Ŀ.	Samp	les		Tests				Strata		0-014	undles to N		
m B.G.L.	Depth	Type No.	Depth	Test Results	Depth (Thick- ness)		Descri	iption			Legend	Red. Level A.O.D.	WATER
					0.10								-
	_		_		0.10	MADE GROUNE content. Gravel i	s fine to coarse	sub-rounded	sandstone	obble e and		41.05	
-	-	-	-		-	mudstone. Cobb sandstone.	les are sub-rou	nded to sub-a	angular				-
-	-	-	-		- 0.60								-
-	- 0.50 -	ES1	-		-								-
-	-	-	-		-							-	
-	-	-	-		0.70	Stiff reddish brow	vn silty CLAY				×××××	40.45	-
-	0.80 - 1.00	⁻ B1	-		-						* * *X		-
-	-	-	-		0.50								-
-1	- 1.00 - -	ES2									<u>→x →</u> xx		-
-	-	-	-			Tanningtod					×	- 	
					1.20	Terminated at 1.	zmbgi					35.55	
PL	AN		Gro	oundwater: No G	Groundwate	r Encountered		Remarks :					
	- 0.6	<u> </u>	Sta	bility: Stable									
(▲ A 0.6 D	В											
-	V C			oring: N/A									
Equ	upment Used:	Hand	Tools										
	Quant	tum	Plas N SA4 0	ewydd FQ		Operator:	Logged By.	Sheet No.	m Per Page	All measu	irements in		
	Quantum Fax: enail: enquiries@quantumgeotech				.co.uk	QGL	P Darby	1 Of 2	Page 3	otherwi	s unless se stated	AG	S

Form Name: TP LOG. Version 2.11.000, 22/05/15 Output By: SteffPicton. Library File: C:\USERS\PUBLIC\DOCUMENTS\BENTLEY\GINTLIBRARIES\QUANTUM 4.GLB.

Contract: Llantarnam 3G Pitch, Cwmbran								
Client: Torfaen County Bord	ough Council		HP02					
Dates : 3/6/20 - 3/6/20	Job Number : Q0269		.15 m A.O.D. evel to Ordnance Datum					
Location : Within playing field	Engineer : Capita	1935	330155.89 E 193509.35 N Co-ordinates to National Grid					





Plas Newydd SA4 OFQ Tel: 01554 744880 Page Page All measurements in metres unless otherwise stated QGL P Darby 2 Of 2 Page All measurements in metres unless otherwise stated



Contract : Llantarnam 3G Pitch, Cwmbran Trial Pit												l Pit N	0.
C	lient : To	orfaer	Count	ty Borough	Counc	;il					ŀ	IP03	
	ates : 3/6/2					mber : Q0269)		ind Level :	Le		nance Da	tum
Lo	cation : V	/ithin p	laying fi	eld	Engine	er : Capita		Coor	dinates:	1935	67.58 E 37.69 N		
ij.	Samp	les		Tests				Strata		0-01	linales to N	allonal Gri	
m B.G.L.	Depth	Type No.	Depth	Test Results	Depth (Thick- ness)		Descri	ption			Legend	Red. Level A.O.D.	WATER
- - - - - - - - - - - - -	- 0.40 - - 0.60 - 0.80 - 1.00 -	- D1 ES1 - ES2 - ES2	- - - - - - - - - - - - - - - - - - -	bundwater: No C	- 0.05 - 0.05 - 1.15 -	TOPSOIL - Ligh MADE GROUNI cobble content. sub-angular mu sub-rounded sa	D - Stiff light bro Gravel is fine to dstone, quartz a ndstone. (Subsc	wn gravelly coarse sub- nd sandston il)	SILT with lor rounded to	W		40.38	
	 < 0.6 ▲ ○ 0.6 	· ->	Sta	ability: Stable									
(\mathbf{D}	В	Sh	oring: N/A									
Equ	ipment Used:	Hand	Tools										
	Quant	um	SA4 0 Tel: 01 Fax:	ewydd FQ 1554 744880 enquiries@quantumgeotech	l.co.uk	Operator: QGL	Logged By. P Darby	Sheet No. 1 Of 2	m Per Page 3	metre	urements in s unless ise stated	AG	J S

Form Name: TP LOG. Version 2.11.000, 22/05/15 Output By: SteffPicton. Library File: C:\USERS\PUBLIC\DOCUMENTS\BENTLEY\GINT\LIBRARIES\QUANTUM 4.GLB.

Contract : Llantarnam 3G Pitch,	Trial Pit No.		
Client: Torfaen County Borough	HP03		
Dates : 3/6/20 - 3/6/20	Job Number : Q0269		.43 m A.O.D. vel to Ordnance Datum
Location : Within playing field	Engineer : Capita	1935	67.58 E 37.69 N linates to National Grid
		18 J	







Contract: Llantarnam 3G Pitch, Cwmbran											Trial Pit No.			
C	lient : To	orfaer	n Count	ty Borough	Counc	il						IP04		
	ntes : 4/6/2								Le	39.85 m A.O.D. Level to Ordnance Datum				
Lo	cation : V	/ithin p	olaying fi	eld	193					19343	031.81 E 436.85 N ordinates to National Grid			
.T.	Samp	les		Tests	Strata									
m B.G.L.	Depth	Type No.	Depth	Test Results	Depth (Thick- ness)		Descri	ption			Legend	Red. Level A.O.D.	WATER	
					0.02	TOPSOIL - Ligh rootlets.	t brown slightly s	sandy SILT w	ith many	ſ	×////× × ·× ·× × ·× ·×	39.83	-	
						Stiff reddish bro	wn sandy clayey	/ SILT.			× ·× .× .> × .× .		-	
_	- 0.00	- 54	_		0.38						× ` × ` ×		-	
	- 0.30 -	D1 ES1	_								· ×· > × · ×			
	_	_	_		0.40	Reddish brown	silty slightly sand	dy CLAY.			× . × .	39.45	-	
											·× · . · . · . ·		-	
	- 0.60 - 0.80	⁻ B1									× · . · . · . ·		-	
-	-		-		-						`× ` . ` . ` ` . ` .× . `		-	
-	-	-	-		0.80						`× ` . ` . ` ` . ` .× . `	-	-	
-	-	-	-		-						×		-	
-1	1 .00 -	ES2	-		-						· · · · · · · · · · · · · · · · · · ·		_	
-	-	-	-		-						×		_	
-	-	-	-		1.20	Terminated at 1				· — — •		38.65		
	A. N.I.				Name and the state	n Engermeter 1								
PL	AN		Gro	oundwater: No G	oroundwate	er Encountered		Remarks :						
	- 0.6		Sta	bility: Stable										
(▲ A 0.6 D	В												
	V <u>C</u>			oring: N/A										
Equ	ipment Used:	Hand	Tools				•							
			Plas N SA4 0	ewydd FQ 554 744880		Operator:	Logged By.	Sheet No.	m Per		urements in			
	Quant	um	Fax:	554 744880 enquiries@quantumgeotech.	co.uk	QGL	P Darby	1 Of 2	Page ' 3	metres	s unless se stated	AG	S	

Form Name: TP LOG. Version 2.11.000, 22/05/15 Output By: SteffPicton. Library File: C:\USERS\PUBLIC\DOCUMENTS\BENTLEY\GINTLIBRARIES\QUANTUM 4.GLB.

Contract : Llantarnam 3G Pitch, Cwmbran							
Client : Torfaen County Bord	ough Council		HP04				
Dates : 4/6/20 - 4/6/20	Job Number : Q0269		39.85 m A.O.D. Level to Ordnance Datum				
Location : Within playing field	Engineer : Capita	19	0031.81 E 3436.85 N -ordinates to National Grid				





Quantum	Plas Newydd SA4 0FQ Tel: 01554 744880 Fax: email: enquiries@quantumgeotech.co.uk	Operator: QGL	Logged By. P Darby	Sheet No. 2 Of 2	m Per Page	All measurements in metres unless otherwise stated	AGS
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Contract : Llantarnam 3G Pitch, Cwmbran											al Pit N	0.	
C	lient : To	orfaer	n Count	ty Borough	Counc	il					ŀ	HP05	
	ntes : 4/6/2				Job Number : Q0269 Ground Level :				Level to Ordnance Datum			tum	
Location : Within playing field				Enginee	19			19340	0071.17 E 3402.82 N -ordinates to National Grid				
J.L.	Samp			Tests		Strata			CO OIU	indices to IV			
m B.G.L.	Depth	Type No.	Depth	Test Results	Depth (Thick- ness)					Legend	Red. Level A.O.D.	WATER	
-	_	_	_		0.10	TOPSOIL - Light brown sandy SILT with many rootlets.				X			
-	-	-	-		0.10 -	Reddish brown s medium cobble sandstone. Cobl	content. Gravel	is fine to coa	rse sub-rou	with nded		39.21	
-	- 0.30 - 0.50	- B1	-		-	sandstone. Cobi	oles are sub-rou	unded sandst	one			-	
-	0.30 -	ES1	-		-						- x-07		-
-	-	-	-		-						$\begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \end{array} \\ \end{array} $		-
-	-	-	-		- 1.00								-
-	-	-	-		-								-
-	- 0.80 -	ES2	-		-								
- 1			_										-
- '	_	_	-		- <u>1.10</u>						****** *******		-
					1.10	Terminated at 1.	imbgi					30.21	
PL	AN		Gro	oundwater: No G	Groundwate	r Encountered		Remarks :					
	→ 0.6	<u> </u>	Sta	bility: Stable									
(▲ A 0.6 D	В											
Б		l le m l		oring: N/A									
Еqı	aipment Used:	Hand	Tools										
	Quant	tum	Plas N SA4 0 Tel: 01	ewydd FQ 554 744880		Operator:	Logged By.	Sheet No.	m Per Page	metres	irements in s unless		
Fax: email: enquiries@quantumgeote				.co.uk	QGL	P Darby	1 Of 2	3	otherwis	se stated	AG	5	

Form Name: TP LOG. Version 2.11.000, 22/05/15 Output By: SteffPicton. Library File: C:\USERS\PUBLIC\DOCUMENTS\BENTLEY\GINTLIBRARIES\QUANTUM 4.GLB.

Contract: Llantarnam 3G Pitch, Cwmbran								
Client: Torfaen County Borough Council								
Dates : 4/6/20 - 4/6/20	Job Number : Q0269		.31 m A.O.D. vel to Ordnance Datum					
Location : Within playing field	Engineer : Capita	1934	071.17 E 402.82 N dinates to National Grid					





m Per

Page

Sheet No.

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P Darby





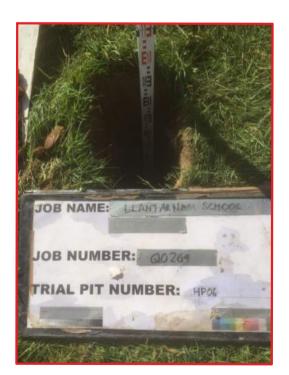
Form Name: TP LOG. Version 2.11.000, 22/05/15 Output By: SteffPicton. Library File: C:\USERS\PUBLIC\DOCUMENTS\BENTLEY\GINT\LIBRARIES\QUANTUM 4.GLB.

Contract : Llantarnam 3G Pitch, Cwmbran												l Pit N	0.
C	lient : To	orfaer	n Count	ty Borough	Counc	il					ŀ	HP06	
	ntes : 5/6/2								nd Level :	Le	.39 m A wel to Ord	nance Da	tum
Lo	cation : W	vithin p	olaying fi	eld	Enginee	19			1933	80198.45 E 93323.67 N p-ordinates to National Grid			
Ţ.	Samp	es		Tests				Strata			unales to N		
m B.G.L.	Depth	Type No.	Depth	Test Results	Depth (Thick- ness)	(Thick- Description					Legend	Red. Level A.O.D.	WATER
-	- - - 0.30 -	- - - ES1	-		- 0.50	MADE GROUNE SILT with low col sub-rounded sar sandstone. (Sub	dstone. Cobble	very sandy sl ravel is fine t es are sub-ro	ightly grave o coarse unded	elly			-
-	- 0.50 - 0.70	- в1	_		0.50	Firm brown and	arov condy cliq	htly gravally (NAX Gray	vol is		37.89	
-	- - 0.70 - -	- - -	-		- - - 0.60	fine to coarse su							-
-1	_	-	-		-						- <u>°</u>		1
DI	AN			undwater: No C		Terminated at 1.		Remarks :					
	 4 0.6 A D A 	B	Sta	bility: Stable									
-	C			oring: N/A									
Equ	ipment Used:	Hand	Tools										
Quantum Flas Newydd SA4 0FQ Tel: 01554 744880 Fax: email: enguiries@quantumgeotecf					.co.uk	Operator: QGL	Logged By. P Darby	Sheet No. 1 Of 2	m Per Page 3	metre	urements in s unless ise stated	AG	I S

Form Name: TP LOG. Version 2.11.000, 22/05/15 Output By: SteffPicton. Library File: C:\USERS\PUBLIC\DOCUMENTS\BENTLEY\GINTLIBRARIES\QUANTUM 4.GLB.

Contract: Llantarnam 3G Pitch, Cwmbran									
Client : Torfaen County Borough Council									
Dates : 5/6/20 - 5/6/20	Job Number : Q0269	Ground Level :	38.39 m A.O.D. Level to Ordnance Datum						
Location : Within playing field	Engineer : Capita	1	30198.45 E 93323.67 N Co-ordinates to National Grid						





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P Darby





,											l Pit N	0.	
C	lient : To	orfaer	n Count	ty Borough	Counc	il						IP07	
	ites : 5/6/2								Ground Level : 37.76 m A.O.D. Level to Ordnance Datum				
Lo	cation : A	long fo	oot path		Enginee	193				1933	257.67 E 317.76 N rdinates to National Grid		
Ţ	Samp	les		Tests		Strata			Co-ora	linates to N	ational Gru		
m B.G.L.	Depth	Type No.	Depth	Test Results	Depth (Thick- ness)		Descri	ption			Legend	Red. Level A.O.D.	WATER
-	- - - 0.30 - 0.50 0.30 - -	- - ES1 -	-		0.05 - 0.05 - 0.55 -	TOPSOIL - Ligh MADE GROUNI with low cobble to coarse sub-ro sub-rounded sat	D - Light brown s content. Sand is ounded sandstor	silty slightly g fine to medi ne. Gravel is	ravelly SAN um. Gravel	is fine		37.71	-
- - -	- - - 0.80 - 1.00 -	- - - - -	-		0.60	Firm reddish bro medium cobble sandstone. Cob sandstone.	content. Gravel bles are sub-ang	is fine to coa gular to sub-r	rse rounded ounded			37.16	-
						1.00 Terminated at 1.0mbgl. Unable to progress due to cobbles							
	AN = 0.6 $A = 0.6$ $A = 0.6$ $A = 0.6$ $C = 0$	B	Sta	bundwater: No G bility: Stable bring: N/A	ອາບແກດເສຊູ	a Encountered		Remarks :					
Equ	ipment Used:	Hand	Tools										
	Equipment Used: Hand Tools Plas Newydd SA4 0FQ Tel: 01554 744880 Fax: email: enquiries@quantumgeotech					Operator: QGL	Logged By. P Darby	Sheet No. 1 Of 3	m Per Page 3	metres	urements in s unless se stated	AG	I S

Contract: Llantarnam 3G Pitch,	Trial Pit No.		
Client: Torfaen County Borough	HP07		
Dates : 5/6/20 - 5/6/20	Job Number : Q0269	Ground Level :	37.76 m A.O.D. Level to Ordnance Datum
Location : Along foot path	Engineer : Capita	1	330257.67 E 193317.76 N Co-ordinates to National Grid







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P Darby



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Contract: Llantarnam 3G Pitch, Cwmbran								
Client: Torfaen County Borough	HP07							
Dates : 5/6/20 - 5/6/20	Job Number : Q0269		7.76 m A.O.D. Level to Ordnance Datum					
Location : Along foot path	Engineer : Capita	193	257.67 E 317.76 N ordinates to National Grid					



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C	Contract: Llantarnam 3G Pitch, Cwmbran									Trial Pit No.			
C	lient : To	o rfae r	n Coun	ty Borough	Counc	il					F	IP08	
	ntes : 5/6/2					mber : Q0269			nd Level :	Level to Ordnance Datum			
Lo	cation : A	long fo	oot path		Enginee	er : Capita		Coord	linates:	1933	44.53 E 26.64 N		1
.T.	Samp	les		Tests			Strata			Co-ora	linates to N	ational Grid	
m B.G.L.	Depth	Type No.	Depth	Test Results	Depth (Thick- ness)		Descri	ption			Legend	Red. Level A.O.D.	WATER
-	- - 0.30 - 0.50 0.30 - -	- - ES1 -	- - - -		0.70	Greyish brown sa cobble content a sub-rounded san sandstone.	nd occasional r	oots. Gravel	is fine to co		× `Q` `Q` `Q` ×Q` XO` XO` XO` XO` XO` XO` XO` XO` XO` XO	- - - - - - - - - - - - - - 	-
-	-	-	-		0.70	Firm reddish bro	wn slightly sand	dy gravelly sil	y CLAY. G	ravel		39.61	
-	_	_	_					quarte.				-	
-1	- 1.00 -	- D1	-		0.40 —								
-	-	-	-		1.10	Terminated at 1.					<u> </u>		
	PLAN Groundwater: No C							Remarks :					
Equ	ipment Used:	Hand		~									
	Equipment Used: Hand Tools Plas Newydd SA4 0FQ Tel: 01554 744880 Fax: email: enuiries@guantumgeotech.					Operator: QGL	Logged By. P Darby	Sheet No. 1 Of 3	m Per Page 3	metres	urements in s unless se stated	AG	S

Contract : Llantarnam 3G Pitch, Cwmbran									
Client : Torfaen County Borough Council									
Dates : 5/6/20 - 5/6/20	Dates : 5/6/20 - 5/6/20 Job Number : Q0269								
Location : Along foot path	193	344.53 E 326.64 N rdinates to National Grid							









All measurements in metres unless otherwise stated

Page

Contract: Llantarnam 3G Pitch, Cwmbran									
Client: Torfaen County Borough Council									
Dates : 5/6/20 - 5/6/20	Job Number : Q0269		0.31 m A.O.D. evel to Ordnance Datum						
Location : Along foot path	Engineer : Capita	193	344.53 E 326.64 N rdinates to National Grid						



Quantum Flas Newydd SA4 0FQ Tel: 01554 744880 Fax: email: enquiries@quantumgeotech.co.uk	Operator: QGL	Logged By. P Darby	Sheet No. 3 Of 3	m Per Page	All measurements in metres unless otherwise stated	AGS	
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4

Contract : Llantarnam 3G Pitch, Cwmbran										Trial Pit No.			
C	lient : To	orfaer	n Count	ty Borough	Counc	il					ŀ	IP09	
	ates : 5/6/2				Job Number : Q0269			Ground Level : 38.15 m A.O.D. Level to Ordnance			nance Da	tum	
Lo	cation : V	/ithin p	olaying fi	eld	Enginee	19				1933	31.92 E 31.02 N		d
Ţ.	Samp	les		Tests		S				0-011	unates to N		
m B.G.L.	Depth	Type No.	Depth	Test Results	Depth (Thick- ness)						Legend	Red. Level A.O.D.	WATER
-	- - 0.20 - 0.40 - - 0.40 - -	- - - - ES1	- - -		- - - 0.60 -	MADE GROUND SILT with low col sub-rounded san sandstone. (Sub	dstone. Cobble	very sandy sli ravel is fine to es are sub-rou	ghtly grave o coarse inded	elly		-	-
- - -	- - - - 1.00 -	- - - - D1	- - -		0.60 - - - 0.50	Firm reddish brov	wn sandy CLAY	Ι.				37.55	-
DI		-	Gr	undwatar: No G	- <u>1.10</u>							- 37.05	
	PLAN Groundwater: No C							Remarks :					
Equ	upment Used:	Hand	Tools				I						
Plas Newydd SA4 0FQ Tel: 01554 744880 Fax: email: enquiries@quantumgcotech.0				.co.uk	Operator: QGL	Logged By. P Darby	Sheet No. 1 Of 2	m Per Page 3	metre	urements in s unless se stated	AG	l S	

Contract : Llantarnam 3G Pitch, Cwmbran									
Client : Torfaen County Borough Council									
Dates : 5/6/20 - 5/6/20	Job Number : Q0269		3.15 m A.O.D. evel to Ordnance Datum						
Location : Within playing field	Engineer : Capita	1933	231.92 E 331.02 N ordinates to National Grid						





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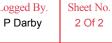
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en	nail: enquiries@quantumgeotech.co.uk

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C	ontract :	Llan	tarnam	3G Pitch, 0	Contract: Llantarnam 3G Pitch, Cwmbran												
C	lient : To	orfaer	n Coun	ty Borough	C	ounci	il		,				ŀ	IP10			
	ates : 4/6/2						nber : Q0269				nd Level :	Le	3.39 m A	nance Da	tum		
Lo	cation : W	/ithin p	olaying fi	eld	E	nginee	r : Capita			Coord	inates:	1933	84.23 E 48.41 N dinates to N		d		
Ţ.	Samp	les		Tests					Strat	ta		0.01	unates to N				
m B.G.L.	Depth	Type No.	Depth	Test Results		Depth (Thick- ness)		Descr	ription	1			Legend	Red. Level A.O.D.	WATER		
	- - - - - - - - - - - - - - - - - - -	- B1 - ES1 - D1 B2 - ES2 				0.70	MADE GROUND with low to mediu rounded sandsto sandstone. (Subs Firm reddish brow	ım cobble con ne and mudst soil) wn sandy SILT	tent. Gr	avel is obbles a	fine to coa	arse		37.69			
PL	AN	1	Gro	oundwater: No G	Grou	Indwater	Encountered		Rema	rks :					1		
C	← 0.6 ▲ A 0.6 D	B		bility: Stable													
Eau	ipment Used:	Hand	Tools	oring: N/A													
	apinent Osed.	nanu		14													
	Quant	tum	SA4 0 Tel: 0 Fax:	ewydd FQ 554 744880 enquiries@quantumgeotech.	.co.uk		Operator: QGL	Logged By. P Darby		et No. Of 2	m Per Page 3	metre	urements in es unless ise stated	AG	S		

Client : Torfaen C	rnam 3G Pitch, County Boroug							Trial Pit N HP10
ates : 4/6/20 - 4/6/2		Job Number	: Q0269		Grou	nd Level :	38. Lev	39 m A.O.D. el to Ordnance D
ocation : Within play	ying field	Engineer : (Capita		Coord	inates:	33018 19334	34.23 E 18.41 N inates to National G
ot								
			JO	B NAME	BER:	1 AR NAM 20264 ER:		
	Plas Newydd SA4 0FQ Tei: 01554 744880					m Per		

C	ontract :	Llan	tarnam	3G Pitch,	Cwmbra	an						Trial Pit No.		
Cl	lient : To	o rfae r	n Count	ty Borough	Counc	il					ŀ	IP11		
	ites : 4/6/2					mber : Q0269			nd Level :	Le	0.01 m A	nance Da	tum	
Lo	cation : V	Vithin p	olaying fi	eld	Enginee	er : Capita		Coor	dinates:	1933	26.14 E 79.20 N dinates to N		d	
.T.	Samp	les		Tests				Strata		0-010	unales to N			
m B.G.L.	Depth	Type No.	Depth	Test Results	Depth (Thick- ness)		Descri	iption			Legend	Red. Level A.O.D.	WATER	
-	- - 0.20 - 0.40 - - 0.40 -	- B1 - ES1	-		- - - 0.50 -	MADE GROUND with low to mediu rounded sandsto sandstone. (Sub	im cobble conte ne and mudsto soil)	ent. Gravel is ne. Cobbles	fine to coa	arse		-	-	
- - - -1	- 0.70 - 0.70 - 0.90 - 0.70 - -	- D1 B2 - ES2 -	- - - -		0.50 - - 0.65 -	Firm reddish bro	-	/ CLAY.				38.51	-	
					-1.15	Terminated at 1.	15mbgl					77.86		
	AN - 0.6 0.6 D C	B	Sta	oundwater: No C bility: Stable oring: N/A	siouriuwwa			Remarks :						
Equ	ipment Used:	Hand	Tools											
	Quant	tum	SA4 0 Tel: 01 Fax:	ewydd FQ 554 744880 enquiries@quantumgeotech	.co.uk	Operator: QGL	Logged By. P Darby	Sheet No. 1 Of 2	m Per Page 3	metre	urements in s unless ise stated	AG	ı S	

Contract: Llantarnam 3G Pitch, Cwmbran									
Client : Torfaen County Boro	ugh Council		HP11						
Dates : 4/6/20 - 4/6/20	Job Number : Q0269		9.01 m A.O.D. evel to Ordnance Datum						
Location : Within playing field	Engineer : Capita	1933	126.14 E 379.20 N rdinates to National Grid						





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Sheet No.

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en	nail: enquiries@quantumgeotech.co.uk







C	ontract :	Llant	tarnam	3G Pitch,	Cwmbra	an						l Pit N	0.
Cl	lient : To	orfaer	n Count	y Borough	Counc	il					ŀ	IP12	
	tes : 4/6/2					nber : Q0269			nd Level :	Le		nance Da	tum
Lo	cation : W	Vithin p	olaying fi	eld	Enginee	er : Capita		Coor	dinates:	1934	57.30 E 03.22 N		d
J.L.	Samp	es		Tests				Strata		0-01	undles to N		
m B.G.L.	Depth	Type No.	Depth	Test Results	Depth (Thick- ness)		Descri	iption			Legend	Red. Level A.O.D.	WATER
	- 0.40 - 0.60 0.40 - - 0.80 - 1.00 - 1.00 -	- B1 ES1 - 20b - ES2 			0.70	MADE GROUNE with low cobble of sandstone, muds sandstone. (Sub Reddish brown s SAND. Gravel is Terminated at 1.	content. Gravel stone and quart soil) slightly clayey lig fine to coarse i	is fine to coa z. Cobbles a ghtly silty slig	rse sub-rour re sub-rour	inded ided		37.94	
PL.	AN		Gro	oundwater: Mo (Groundwate	er Encountered		Remarks :					
	← 0.6 ▲ A	j →	Sta	bility: Stable									
C	0.6 D ▼ C	В	She	oring: N/A									
Equ	ipment Used:	Hand	Tools										
	Quant	tum	SA4 01 Tel: 01 Fax:	ewydd ⁻ Q 554 744880 enquiries@quantumgeotech	.co.uk	Operator: QGL	Logged By. P Darby	Sheet No. 1 Of 3	m Per Page 3	metre	urements in s unless ise stated	AG	I S

Contract: Llantarnam 3G Pitch, Cwmbran									
Client: Torfaen County Bor	ough Council		HP12						
Dates : 4/6/20 - 4/6/20	Job Number : Q0269		3.64 m A.O.D. evel to Ordnance Datum						
Location : Within playing field	Engineer : Capita	1934	30157.30 E 93403.22 N Co-ordinates to National Grid						









Contract : Llantarnam 3G Pitch, Cwmbran									
Client: Torfaen County Borough Council									
Dates : 4/6/20 - 4/6/20	Job Number : Q0269		3.64 m A.O.D. evel to Ordnance Datum						
Location : Within playing field	Engineer : Capita	1934	57.30 E 103.22 N dinates to National Grid						







С	ontract :	Llant	tarnam	3G Pitch, 0	Cwmbra	an					Trial Pit No.				
C]	lient : To	orfaer	n Coun	ty Borough	Counc	il					ŀ	HP13			
	ntes : 3/6/2					mber : Q0269			und Level :	Le		lnance Da	tum		
Lo	cation : W	Vithin p	olaying fi	eld	Enginee	er : Capita		Coo	rdinates:	1934)199.64 E 3449.95 N ordinates to National Grid				
Ţ.	Sampl	es		Tests				Strata		00 011					
m B.G.L.	Depth	Type No.	Depth	Test Results	Depth (Thick- ness)		Descri	ption			Legend	Red. Level A.O.D.	WATER		
					0.10	TOPSOIL - Light		-					-		
	_	[_		0.10	MADE GROUNE cobble content.	Gravel is fine to	coarse and	ular to roun	ded		39.08]		
-	- 0.30 -	- ES1	-		_ 0.30	quartz and sand and quartz.	stone. Cobbles	are sub-rou	nded sands	tone			-		
-	-	-	-		0.40	Stiff reddish brow	wn CLAY.					38.78]		
-	-	-	-		-]		
-	-	-	-		-										
-	-	-	-		-										
-	0.80 - 1.00	⁻ B1	-		0.80										
-	-	-	-		-										
-1	1.00 -	D1 ES2			[-		
		[_												
					1.20	Terminated at 1.	2mbgl					37.98			
PL	AN		Gro	oundwater: No g	roundwate	r encountered		Remarks :					1		
	→ 0.6	<u> </u>	Sta	bility: Stable											
(▲ A D.6 D	В													
E~-	vinment Used:	Lond		oring: N/A											
Equ	ipment Used:	Hand	Tools												
	Quant	tum	Fax:	ewydd FQ 554 744880 enquiries@quantumgeotech	.co.uk	Operator: QGL	Logged By. P Darby	Sheet No. 1 Of 2	m Per Page 3	metre	urements in s unless ise stated	AG	I S		

Contract: Llantarnam 3G Pitch, Cwmbran						
Client: Torfaen County Borough Council						
Dates : 3/6/20 - 3/6/20	Job Number : Q0269	Q0269 Ground Level : 39.1				
Location : Within playing field	Engineer : Capita	1934	99.64 E 49.95 N dinates to National Grid			





Sheet No.

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Contract : Llantarnam 3G Pitch, Cwmbran								Tria	al Pit N	0.			
C	lient : To	orfaer	n Count	ty Borough	Counc	il					ŀ	HP14	
Da	ntes : 3/6/2	20 - 3/6	6/20			mber : Q0269			ind Level :	39 Le	.51 m A vel to Ora	. O.D . Inance Da	tum
Lo	cation : V	Vithin p	olaying fi	eld	Enginee	er : Capita		Coor	Coordinates: 330112.67 E 193504.54 N				. 1
ų.	Samp	les		Tests	Strata			Strata		Co-orc	linates to N	lational Gri	
m B.G.L.	Depth	Type No.	Depth	Test Results	Depth (Thick- ness)		Descri	ption			Legend	Red. Level A.O.D.	WATER
					0.10	TOPSOIL - Light	brown slightly	sandy SILT v	vith many ro	ootlets			
		[0.10	MADE GROUND cobble content. (Gravel is fine to	coarse sub-	rounded to			39.41	-
-	-	-	-		-	sub-angular muc sub-rounded sar	lstone, quartz a idstone. (Subsc	nd sandston pil)	e. Cobble a	ire			
-	-	-	-		0.60								
-	- 0.50 -	[–] D1	-		-							-	-
-	-	ES1	-		-								-
-	-	-	-		0.70	Stiff orangeish b	rown sandy slig	htly gravelly	CLAY. Grav	vel is		38.81	-
-	- 0.80 -	[–] B1	-		-	fine to coarse an	gular to rounde	d mudstone	and sandst	one.	 		-
-	-	-	-		0.40								-
-1	1.00 -	ES2	-		-								-
-	-	-	-		1.10	Trial Pit terminat	ed at 1.1mbgl				± _*	38.41	
PL	AN		Gro	oundwater: No C	Groundwate	r Encountered		Remarks :					
	0.6	<u>i — </u>	Sta	ability: Stable									
(▲ A 0.6 D	В		.,									
	↓ <u>C</u>			oring: N/A									
Equ	upment Used:	Hand	Tools										
	0	hu u nac	SA4 0	ewydd FQ		Operator:	Logged By.	Sheet No.	m Per		irements in		
	Quant	lum	Tel: 01 Fax:	1554 744880 enquiries@quantumgeotech	.co.uk	QGL	P Darby	1 Of 2	Page 3	metre	s unless se stated	AG	S

Contract: Llantarnam 3G Pitch, Cwmbran						
Client : Torfaen County Borough Council						
Dates : 3/6/20 - 3/6/20	Job Number : Q0269		39.51 m A.O.D. Level to Ordnance Datum			
Location : Within playing field	Engineer : Capita	19	0112.67 E 3504.54 N -ordinates to National Grid			







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Sheet No.

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m Per Page All measurements in metres unless otherwise stated



Contract : Llantarnam 3G Pitch, Cwmbran								Tria	l Pit N	0.			
Cl	lient : To	orfaer	n Count	ty Borough	Counc	il					ŀ	IP15	
Da	ites : 4/6/2	20 - 4/6	6/20		Job Nu	mber : Q0269)		und Level :	Le		nance Da	tum
Lo	cation : V	Vithin p	olaying fi	eld	Enginee	193					077.55 E 460.00 N ordinates to National Grid		
J.L.	Samp	les		Tests				Strata					
m B.G.L.	Depth	Type No.	Depth	Test Results	Depth (Thick- ness)		Descri	-			Legend	Red. Level A.O.D.	WATER
- - - - - -	- - - - - - - - - - - - - - - - - -	- ES1 - ES1 - B1 - ES2 -	-		0.05 - 0.05 - 0.65 	TOPSOIL - Ligh MADE GROUN with low cobble sandstone, muc sandstone. (Sub Reddish brown fine to coarse ro	D - Stiff light bro content. Gravel stone and quart osoil)	wn slighty s is fine to co z. Cobbles a	andy gravell arse sub-rou are sub-rour	y SILT unded nded		39.34 	-
PL	AN		Gro	oundwater: No C	Groundwate	er Encountered		Remarks :					
C	• 0.6 • 0.6	B		ibility: Stable oring: N/A									
Equ	aipment Used:	Hand	Tools										
	Quant	tum	SA4 0 Tel: 01 Fax:	ewydd FQ 554 744880 enquiries@quantumgeotech	.co.uk	Operator: QGL	Logged By. P Darby	Sheet No. 1 Of 3	m Per Page 3	metre	urements in s unless ise stated	AG	I S

Contract: Llantarnam 3G Pitch, Cwmbran						
Client: Torfaen County Borough Council						
Dates : 4/6/20 - 4/6/20 Job Numb	per : Q0269	Ground Level :	39.39 m A.O.D. Level to Ordnance Datur			
Location : Within playing field Engineer	330077.55 E 193460.00 N Co-ordinates to National Grid					

LLANTARNAM SCHOO

JOB NAME:

JOB NUMBER: Q0264





Contract : Llantarnam 3G Pitch, Cwmbran Client : Torfaen County Borough Council					
Dates : 4/6/20 - 4/6/20	Job Number : Q0269		.39 m A.O.D. vel to Ordnance Datum		
Location : Within playing field	Engineer : Capita	1934	77.55 E 60.00 N dinates to National Grid		



AGS

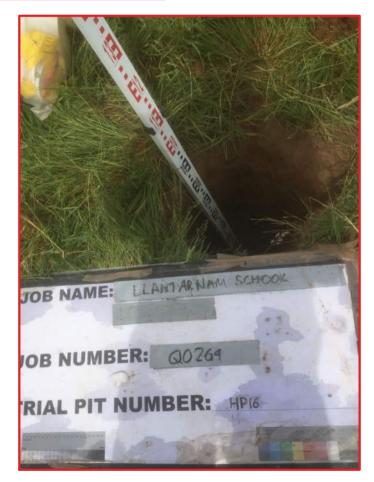




Contract : Llantarnam 3G Pitch, Cwmbran								al Pit N	0.						
C	lient : To	orfaer	n Count	ty Borough	Counc	cil							ŀ	HP16	
	ates : 4/6/2									Ground Level : 39.42 m A.O.D. Level to Ordnance Datum				tum	
Lo	ocation : W	vithin p	laying fi	eld	Engine	er :	Capita			Coordi	nates:	1934	54.53 E 27.78 N		ı
H	Samp	les		Tests	Stra			Strat	Co-ordinates to National Gi rata						
m B.G.L.	Depth	Type No.	Depth	Test Results	Depth (Thick- ness)			Descr	ription				Legend	Red. Level A.O.D.	WATER
					0.01		PSOIL - Light otlets.	brown slightly	sandy S	SILT with	n many	[× · · × · · >	39.41	-
1	-	-	-		_ 0.01			vn sandy claye	ey SILT.]	× ·× ·× ·> × ·×		1
-	-	-	-		-								× × × × × × × × × × × × × × × × × × ×		1
-	- 0.30 -	ES1	-										· ×· > ×· ×		1
-	- 0.40 -	⁻ D1	-		-								· ×· > × · × · ×· >	-	1
-	-	-	-		F								× · × · × · × · × · × · × · × · × · × ·		1
-	- 0.60 - 0.80	⁻ B1	-		1.19								× `× ` > × ` × ` >		1
-	-	-	-		-								× ·× ·× ·> × ·× ·		-
-	-	-	-		-								× × ×		-
-	-	-	-		-								× · × · ×	-	4
-1	- 1.00 -	- D2	_		-								× · × · ×· > × . ×		-
-	-	ES2 -	-		-								× × × × × × × × × × × × × × × × × × ×		4
-	-	-	-		1.20	Te	rminated at 1.2	<u></u>					× × ·		
								0							
									-						
PL	AN		Gro	oundwater: No G	Groundwate	er En	countered		Remar	·ks :					
	▲ 0.6		Sta	bility: Stable											
(A A D.6 D	В													
	V <u>C</u>	~	Sh	oring: N/A											
Equ	upment Used:	Hand	Tools												
			Plas N	ewydd			Operator:	Logged By.	Shoo	et No.	m Per	A.!			
	Quant	tum	Fax:	554 744880			QGL	P Darby		Of 2	Page	metre	urements in s unless ise stated	AG	S
1	· •		email [.]	enquiries@quantumgeotech	.co.uk		1		- I		3	1			

Contract: Llantarnam 3G Pitch, Cwmbran Client: Torfaen County Borough Council					
Job Number : Q0269 Engineer : Capita	Coordinates: 3300 1934).42 m A.O.D. evel to Ordnance Datum)54.53 E 127.78 N dinates to National Grid			
	Job Number : Q0269	ugh Council Job Number : Q0269 Ground Level : 38 Engineer : Capita Coordinates: 3300 1934			





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C	Contract: Llantarnam 3G Pitch, Cwmbran Trial Pit No.								0.				
C	lient : To	orfaer	n Count	ty Borough	Counc	il					ŀ	IP17	
							Le		nance Da	tum			
Lo	cation : V	Vithin p	olaying fi	eld	Enginee	er : Capita		C	oordinates:	1933	97.03 E 77.07 N		d
Ţ.	Samp	les		Tests				Strata		0-07	anales lo N		
m B.G.L.	Depth	Type No.	Depth	Test Results	Depth (Thick- ness)		Desci	ription			Legend	Red. Level A.O.D.	WATER
	- 0.40 - - 0.50 - 0.70 - 1.00 -	- ES1 - B1 - ES2 - ES2			1.10	TOPSOIL - Lig MADE GROUN SILT with low to coarse sub-rou Cobbles are su	ID - Light browr o medium cobbl nded sandstone b-rounded sand	n slightly gr le content. e and occa	avelly slightly Gravel is fine	sandy to		A.O.D. 38.56	
PL	AN		Gro	oundwater: No C	Groundwate	r Encountered		Remarks	:				
	▲ ● 0.6	;_ →	Sta	bility: Stable									
(A D.6 D C	В	Sh	oring: N/A									
Equ	aipment Used:	Hand	Tools	-									
			Plas N	ewydd		Onorator	Logged D	Shoot N	Jo m Per				
Quantum Plas Newyod SA drQ Tel: 01554 744880 Fax: email: enquiries@quantumgeotech.co.uk P Darby QGL P Darby 1 Of 2 3 All measurements in Page 1 Of 2 3 All measurements in metres unless otherwise stated						AG	S						

Contract: Llantarnam 3G Pitch, Cwmbran							
Client: Torfaen County Borough Council							
Dates : 4/6/20 - 4/6/20	Dates : 4/6/20 - 4/6/20 Job Number : Q0269 Ground Level : 38.5						
Location : Within playing field	Engineer : Capita		330197.03 E 193377.07 N Co-ordinates to National Grid				





m Per

Page





Contract : Llantarnam 3G Pitch, Cwmbran T									l Pit N	0.			
Client : Torfaen County Borough Council HP18									HP18				
Dates : 3/6/20 - 3/6/20 Job Number : Q0269 Ground Lev							Le		Inance Dat	tum			
Lo	cation : W	vithin p	olaying fi	eld	Enginee						330241.85 E 193436.21 N Co-ordinates to National Grid		
Ţ.	Samp	es		Tests				Strata		00000	indico to T		
m B.G.L.	Depth	Type No.	Depth	Test Results	Depth (Thick- ness)		Descri	iption			Legend	Red. Level A.O.D.	WATER
	_	_	_			TOPSOIL - Light	t brown SILT wit	th many root	ets				
_	_	_	_		0.20]
_	-	-	_		0.20	Firm to stiff light	orangeish brow	/n SILT / CLA	λY		×	40.01 -	1
	- 0.40 - 0.60	⁻ В1	_										1
			_		0.40						× × ·]
_	- 0.50 -	- ES1	_								×]
_	_	_	_		0.60	Firm orangeish t fine to coarse ar	orown slightly gr ngular Mudstone	ravelly silty C e.	LAY. Grave	el is	×~~~ × ~~~	39.61	1
_	_	_	_		_						`X` XX X	-	1
	_	_	_		_						× × × ×		1
-1					0.60						×; ××		1
['	1.00 -	D1 ES2									×_ ×_ ×		1
]
					1.20	Terminated at 1.	2mbgl					39.01	
PL	AN		Gro	oundwater: No C	Groundwate	r Encountered		Remarks :					
112								itemuno :					
	 4 0.6 ▲ A 		Sta	bility: Stable									
(0.6 D B Shoring: N/A												
Equ	ipment Used:	Hand	Tools										
			Plas N	ewydd		Operator:	Logged By.	Sheet No.	m Per				
	Plas Newydd SA4 0FQ Tel: 01554 744880 Fax: email: enquiries@quantumgeotech.co.ukOperator: QGLLogged By. P DarbySheet No. 1 Of 2m Per Page 3All measurements in metres unless otherwise stated						S						

Form Name: TP LOG. Version 2.11.000, 22/05/15 Output By: SteffPicton. Library File: C:\USERS\PUBLIC\DOCUMENTS\BENTLEY\GINTLIBRARIES\QUANTUM 4.GLB.

Contract : Llantarnam 3G Pitch, Cwmbran							
Client : Torfaen County Borough Council							
Dates : 3/6/20 - 3/6/20	Job Number : Q0269		0.21 m A.O.D. Level to Ordnance Datum				
Location : Within playing field	Engineer : Capita	193	241.85 E 436.21 N ordinates to National Grid				





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C	Contract : Llantarnam 3G Pitch, CwmbranTrial Pit No.												
C	Client : Torfaen County Borough Council TP19												
Dates : 8/6/20 - 8/6/20					300 Number . Q0203			Le	39.81 m A.O.D. Level to Ordnance Datum				
Lo	ocation : V	/ithin p	laying fi	eld	Enginee	193			1935	76.62 E 22.96 N		J	
Ļ.	Samp	les		Tests				Strata		Co-ora	linates to N	ational Grid	
m B.G.L.	Depth	Type No.	Depth	Test Results	Depth (Thick- ness)		Descr	iption			Legend	Red. Level A.O.D.	WATER
-	-	-	-		0.20	TOPSOIL - Light	brown sandy S	SILT with	many rootlets				
-	-	-	-		0.20 \0.10 /	MADE GROUND) - Light brown	slightly s	andy slightly gra	avelly		39.61	
-	-	-	-		- 0.30	SILT. Gravel is fi Stiff reddish brov	ne to coarse a vn slightly sand	ngular sa dy clayey	SILT.	/	× — × ; - × — ;	39.51	-
t	-	-	-		E						× <u> </u>		
	-	-	-		-						×Ŷ×,		
-	-	-	-		-						* * ;	-	-
- -1	_	-	-		⁻ 1.20						× × ×		
- '	-	-	-		-						$\times \xrightarrow{\times} \times$		-
-	-	-	-		-						$\times \frac{\times}{\times} \times$		-
	-	-	_		-						×	-	
-	-	-	-		1.50	Reddish brown v	ery clavey CP		avel is fine to		×× ;	38.31	
-	-	-	-		0.20	medium angular	mudstone	AVEL. GI	aver is line to				Ť
-	-	-	-		1.70 -	Stiff reddish brov coarse angular m	vn gravelly SIL nudstone.	T / CLAY	. Gravel is fine	to		38.11	
-2	_	_	_		_								
-	-	-	-		-								-
	-	-	-		1.00						<u> </u>		
-	-	-	-		-								
-	-	-	_		-						<u>~ </u>		-
	-	-	_										
					2.70	Terminated at 2.	7mbgl to under	rtake soal	kaway tests			37.11	
PL	AN		Gro	oundwater: Seep	age betwee	en 1.5 and 1.7mbg	I	Remark	s :				
	 < 2.5 ▲ ▲ 		Sta	bility: Stable									
(D.6 D ▼ C	В	Sh	oring: N/A									
Equ	uipment Used:	JCB 3	зсх										
			Di 31	ewydd									_
	Quant	tum	SA4 0 Tel: 01 Fax:	554 744880		Operator: Garth Plant	Logged By. P Darby	Sheet 1 1 Of	2 Page	metres	urements in s unless se stated		S
	· `\'			enquiries@quantumgeotech.	.co.uk	Hire			5				U

Contract : Llantarnam 3G Pitch, Cwmbran							
Client: Torfaen County Borough Council							
Dates : 8/6/20 - 8/6/20	Job Number : Q0269	Ground Level :	39.81 m A.O.D. Level to Ordnance Datum				
Location : Within playing field	Engineer : Capita	19	0076.62 E 03522.96 N 0-ordinates to National Grid				





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Sheet No.

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th Plant Hire	P Darby

All measurements in metres unless otherwise stated	AGS



Contract: Llantarnam 3G Pitch, Cwmbran					Trial Pit No.								
Client: Torfaen County Borough Council							ГР20						
Dates : 8/6/20 - 8/6/20							round Level :	Level to Ordnance Datum					
Location : Within playing field				193			1933	0202.44 E 3338.09 N ordinates to National Grid					
Ţ.	Samp	les		Tests				Strata		co on	indico to 1	unonui Gr	
m B.G.L.	Depth	Type No.	Depth	Test Results	Depth (Thick- ness)		Descr				Legend	Red. Level A.O.D.	WATER
-	-	-	-		0.20	TOPSOIL - Light	brown sandy S	SILT with r	nany rootlets.				-
-	-	-	-		0.20	MADE GROUND Gravel is fine to o) - Light brown	slightly sa	ndy gravelly S	ILT.		38.14	1
-	-	-	-		- - -				angular.				-
-	-	-	-		0.60	Firm reddish brov	wn silty CLAY.				× × ×	37.74	1
-	-	-	-		-						<u>→x</u> → x x_ - x →		-
-1	-	-	-		0.80						×^ 		-
-	-	-	-		-								-
	-	-	-		1.40	Light brown and	brown slightly	clayey san	dy GRAVEL w	/ith		36.94	-
-	-	-	-		-	low cobble conte sandstone. Cobb	les are sub-an	ne to coars Igular sand	se angular Istone.				1
-	-	-	-		-								-
- -2	-	-	-		- 1.00								-
-	-	-	-		-						. 0. 0 . 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1		
-	-	-	-		-								
-	-	-	-		2.40	Terminated at 2.4	4mbgl to under	rtake soak	away tests			35.94	-
PL	AN		Gro	oundwater: Seep	age below	2.3mbgl		Remarks	:				
Stability: Stable													
↓ C Shoring: N/A Equipment Used: JCB 3CX													
Plas Newydd SA4 0FQ Operator: Logged By. Sheet No. m Per Dage All measurements in													
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Contract : Llantarnam 3G Pitch, Cwmbran					
Client: Torfaen County Borough Council					
Dates : 8/6/20 - 8/6/20	Job Number : Q0269		3.34 m A.O.D. evel to Ordnance Datum		
Location : Within playing field	Engineer : Capita	1933	202.44 E 338.09 N dinates to National Grid		





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Garth Plar Hire

Operator:	Logged By.
Garth Plant Hire	P Darby

All measurements in metres unless otherwise stated	A



KEY TO BOREHOLE AND TRIAL PIT LOGS

MATERIAL LEGENDS Made Ground Topsoil Clay Sand Silt Gravel Peat **Boulders** Cobbles \cap 0 0 Ď.Ď 00 Volcaniclastic Chalk Conglomerate Mudstone Void Asphalt Siltstone Sandstone Limestone Mudstone / $\triangle \Delta$ Ironstone Breccia Siltstone Δ Δ -Ċ ÷Ċŕ Coal Coral ¢ Bedrock ö Igneous Shale Gypsum (Coarse Grained) Igneous Igneous Metamorphic (Fine Grained) (Medium Grained) (Coarse Grained) Metamorphic Metamorphic (Fine Grained) (Medium Grained)

INSTALLATION / BACKFILL DETAILS



Arisings





Bentonite seal



Plain pipe



0.0

Slotted pipe

Concrete

Filter



Bentonite cement grout



Pea Gravel



Piezometer / Standpipe tip



KEY TO BOREHOLE AND TRIAL PIT LOGS

m.A.O.D. metres Above Ordnance Datum.

SAMPLE AND TEST TYPES

- U Undisturbed driven tube sample 102mm diameter, 450mm long.
- P Undisturbed pushed piston sample 102mm diameter, 1000mm long.
- **TW** Undisturbed thin walled push in sample 100mm diameter, 750mm long.
- B Bulk disturbed sample.
- BLK Block Sample
- **CBR** Heavy duty undisturbed sample 154 mm diameter (CBR mould).
- D Small disturbed sample.
- LB Large Bulk disturbed sample (for earthworks testing)
- c Core sample
- Water sample
- G Gas sample
- **ES** Environmental sample (soil)
- j Jar sample
- t Tub sample
- P Pot sample
- s Small sample
- v Vial sample
- **S** Standard Penetration Test using split spoon sampler. (See Note).
- **C** Standard Penetration Test using a solid 60 degree cone. (See Note).

NOTE: Where a single value is quoted this is the N value for 300 mm penetration following a seating drive of 150 mm. Where this full penetration is not achieved the number of blows is quoted for the penetration below the seating drive eg. 63/160 mm. Where total penetration is less than the seating drive this is indicated by a + and the number of blows for total penetration is quoted eg. +50/75 mm.

- **HV** Hand Vane Test. Vane undrained shear strength, c_{μ} , quoted in kPa.
- **V** Borehole Vane Test. Vane undrained shear strength, c_{μ} , quoted in kPa.
- FHT/RHT Falling / Rising Head Permeability Test.

CORE RUN DETAILS

- TCR Total Core Recovery, %
- SCR Solid Core Recovery, %
- RQD Rock Quality Designation, %
- **FI** Fracture Index. NI Non intact where > 25 No. per metre length.

WATER COLUMN SYMBOLS

- First water strike, second water strike etc.
- $\frac{1}{2}$ $\frac{2}{2}$ Standing water level after first strike, second strike etc.
 - Seepage.





APPENDIX III – WINDOW SAMPLING LOGS

Client : Torfaen County Borough Council										low No	Sam	ple			
Dates : 5/6/20 - 5/6/20Job Number : Q0269Ground Level : 39.8Location : Within playing fieldEngineer : CapitaCoordinates: 330092 193525													NS		
Da	ates : 5/	6/20 ·	- 5/6/20			Job Numbe	r: Q0269		Grou	nd Level	l: 39	.87 m A vel to Ord			ım
Lo	ocation :	With	nin playir	ng field		Engineer :	Capita		Coord	dinates:	3300 1935	92.27 E	1		
Ŀ.	Samp	les	Sam	ple Run		1		Strata							
om B.G.L.	Depth	Type No.	Diam. (mm)	Recovery (%)	Depth (Thick- ness)		De	escription			Legend	Red. Level A.O.D.	Water	Inst Bac	
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-					-	-					$\begin{smallmatrix} & \times & \times \\ \times & \times \\ & \times & \times \end{smallmatrix}$				
-					0.60 - 0.20	Reddish brov	vn and light br e angular sand	rown clayey GR/ dstone.	VEL. Grave	l is	° <u> </u>	39.27			
-	0.80 - 2.30	B 1			0.20	Firm to stiff re	eddish brown	very sandy sligh	tly gravelly (CLAY	<u> </u>			E	
- -1					-	 locally light g – rounded sand 	rey. Gravel is dstone.	fine to medium	sub-rounded	to			-		
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-					-	-					<u> </u>		-		
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No	Groundwa	ter En	countered	Plas Newydd						100 D					
	Qua	ntu	m	Plas Newydd SA4 0FQ Tel: 01554 744880 Fax: email: enquiries@qua	antumgeotech.	co.uk	Operator: QGL	Logged By. P Darby	Sheet No. 1 Of 1	m Per Page 5	metre	urements ir s unless ise stated	n	AG	8
	7			: 91				1							-

Form Name: WINDOW SAMPLE. Version 2.10.000, 28/05/13 Output By: SteffPicton. Library File: C:\USERS\PUBLIC\DOCUMENTS\BENTLEY\GINT\LIBRARIES\QUANTUM 4.GLB.

Contract : Llantarnam	3G Pitch, Cwmbran			Boreho	
Client : Torfaen County	Borough Council		I	WS	
Dates : 5/6/20 - 5/6/20	Job Numbe	er : Q0269	Ground Level :	39.87 m A.O.E Level to Ordnanc) . ce Datum
Location : Within playing fie	ld Engineer :	Capita	Coordinates:	330092.27 E	
JO BO FR	B NUMBER: 0025 DREHOLE NUMBER:	WS01 OF: 1 TO (m): 3.0		330092.27 E 193525.76 N Co-ordinates to Nation	al Grid
Fax:	ydd 4 744880 quiries@quantumgeotech.co.uk	Operator: Logged By. QGL P Darby	Sheet No. m Per Page 1 Of 1 2	All measurements in metres unless otherwise stated	AGS

Contract : Llantarnam 3G Pitch, Cwmbran Client : Torfaen County Borough Council									Wind	ow S No	San	ıple			
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-	0.30 - 0.50	ES 2			0.20	MADE GROU	JND - Light br	own slightly san rse angular san	dy slightly gr	avelly		39.57			
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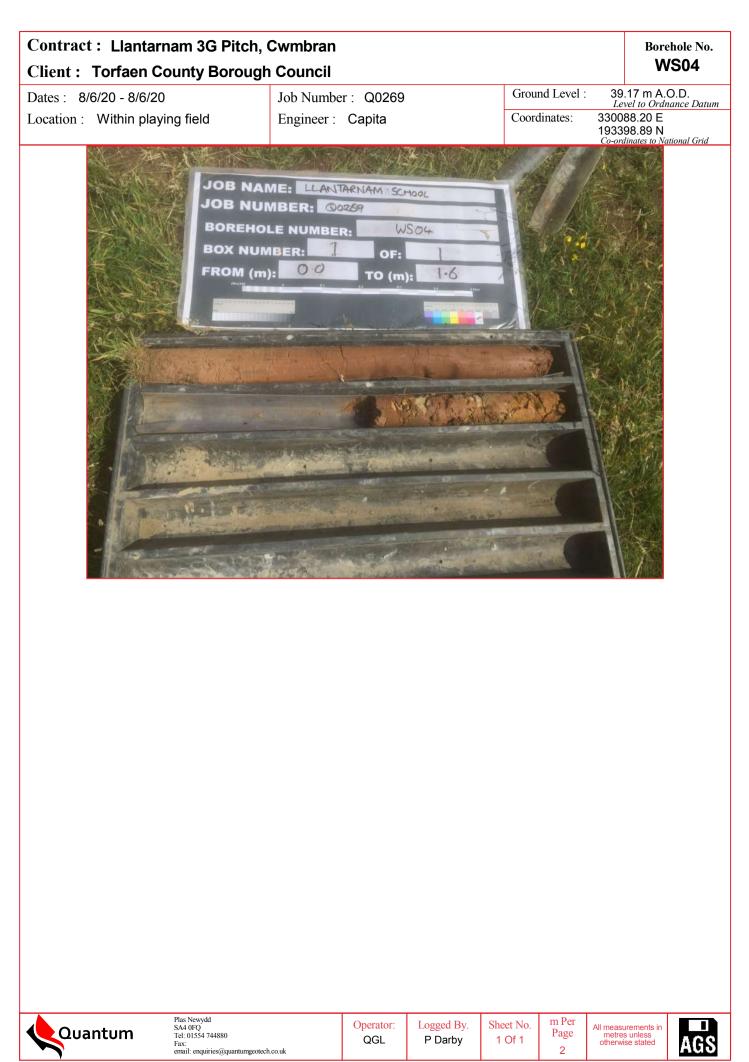
Form Name: WINDOW SAMPLE. Version 2.10.000, 28/05/13 Output By: SteffPicton. Library File: C:USERS\PUBLIC\DOCUMENTS\BENTLEY\GINT\LIBRARIES\QUANTUM 4.GLB.

Contract : Llantarna Client : Torfaen Co						B	Borehole No. WS02
Dates : 8/6/20 - 8/6/20		Number : Q0269		Groun	d Level :	39.77 m	A.O.D.
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Quantum	Plas Newydd SA4 0FQ Tel: 01554 744880 Fax: email: enquiries@quantumgeotech.co.uk	Operator: QGL	Logged By. P Darby	Sheet No. 1 Of 1	m Per Page 2	All measurement metres unless otherwise state	

Client: Torfaen County Borough Council Wools Dates: 8/8/20 - 8/8/20 Location: Bo Number: Could and Level: Borom A.Lost. Council Level: Borom A.Lost. Description Tormania Sample A.Strate Sample A.Strate Council Level: Borom A.Strate Borom	Client : Torfaen County Borough Council WS										ow S No	Sam	ple			
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Equipment used: Dando Terrier. Using 87mm sample barrel Remarks: Hand excavated trial pit to 1.2mbgl No Groundwater Encountered	-					-	-						-			
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Remarks: Hand excavated trial pit to 1.2mbgl No Groundwater Encountered Plas Newydd SA4 0FQ Operator: Logged By. Sheet No. m Per Bage All measurements in	-					-	-						-			
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Outperation State Port All measurements in Logged By. Sheet No. All measurements in	No				Plas Newydd			Operator	Loggad Dy	Sheet No.	m Per				-	
Fax: email: enquiries@quantumgeotech.co.uk QGL P Darby 1 Of 1 5 otherwise stated AGS		Qua	ntui	m	SA4 0FQ Tel: 01554 744880 Fax:	ntumgeotech.	co.uk	QGL	P Darby	Sheet No. 1 Of 1	Page	metre	s unless		AGS	S

Datas: 8/6/20 8/6/20 Lob Number: 00260 Ground Level: 39.70 m/	WS03
Location : Within playing field Dob Number : Capita Location : Within playing field Location : Within playing field Location : Within playing field Location : Capita Level to OL Coordinates : 330041.57 193436.18 Co-ordinates to BOR HOLE NUMBER: WS03 BOX NUMBER: OF:	
JOB NAME: JOB NAME: JOB NAME: JOB NUMBER: WS03 BOREHOLE NUMBER: WS03 BOX NUMBER: OF:	dnance Datum
JOB NAME: LEAN UNKINAM SCHOOL JOB NUMBER: @0269 BOREHOLE NUMBER: WS03 BOX NUMBER: J OF:	N
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Plas Newydd SAM 0FQ Ta: USSA 744880 Vocantum Yd: USSA 74480 Vocantum Yd: USSA 74480	n
QuantumSA4 0FQ' Tel: 01554 744880 Fax: email: enquiries@quantumgeotech.co.ukOperator: ULogged By. QGLSheet No. P DarbyIn Fet Page 2All measurements i metres unless otherwise stated	AGS

C	Contract : Llantarnam 3G Pitch, Cwmbran Window Sample No. Client : Torfaen County Borough Council WS04 Dates : 8/6/20 - 8/6/20 Job Number : 00269 Ground Level : 39.17 m A.O.D.													
Client : Torfaen County Borough Council Dates : 8/6/20 - 8/6/20 Job Number : Q0269 Ground Level : 39.1 Location : Within playing field Engineer : Capita Coordinates: 33008														
Dates :8/6/20 - 8/6/20Job Number :Q0269Ground Level :Location :Within playing fieldEngineer :CapitaCoordinates:												.17 m A.C vel to Ordna).D. ance Dat	ит
Lo	cation :	With	nin playin	g field		Engineer :	Capita		Coord	linates:	3300 1933	88.20 E 98.89 N linates to Nat		
Ŀ.	Samp	les	Samp	le Run				Strata			0-01	unates to Nat		
om B.G.L.	Depth	Type No.	Diam. (mm)	Recovery (%)	Depth (Thick- ness)			Description				Legend	Red. Level A.O.D.	Water
-					_ 0.10			ndy SILT with ma own slightly san		ULT Grave	al is			
-					_ 0.10 _ 0.25 _	fine to coarse	sub-rounded	sandstone. (Su	b-soil)				-	
-	0.35 - 1.00	B 1			_ 0.35	- Firm reddish	brown silty CL	AY.				× 	38.82 -	
-	0.50 - 0.70	D 1			-	-						<u> </u>	-	
-					- 0.65	-						~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	-	
-					-	-						× × ×	-	
-1	1.00 - 1.60	B 2			1.00	Reddish brow	n clavev sligh	tly sandy GRAV	'EL. Gravel i	s fine to co	arse	- *- * *- * 0 0 :- _0 0_0 0	38.17	
-					-	angular sand							-	
-					0.60	-						ع: 0 هـ 0 : 	-	
-					-	-						; <u>~</u> ; , <u>~</u> _0 <i>~</i> ;∂ c 10 , ∧ ; 0 ; ∧	-	
-					-	-								
-					1.60	l erminated u	pon refusal at	1.6mbgl					37.57	
					-								-	
-2					-	-							-	
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-					-	-							-	
Equipment used: Dando Terrier. Using 87mm sample barrel Remarks: Hand excavated trial pit to 1.2mbgl														
No	Groundwa	iter En												
	Qua	ntui	m	Plas Newydd SA4 0FQ Tel: 01554 744880 Fax: email: enquiries@qua	ntumgeotech.	co.uk	Operator: QGL	Logged By. P Darby	Sheet No. 1 Of 1	m Per Page 5	metre	urements in s unless ise stated	AG	S
Form N	r Name: WINDC	W SAMF					e: C:\USERS\PUBL	.IC\DOCUMENTS\BE	NTLEY\GINT\LIE		NTUM 4.G	LB.		



Client : Torfaen County Borough Council Dates : 8/6/20 8/6/20 Ich Number : 00260 Ground Level : 38.82											Windo	w San No.	ple	
Client : Torfaen County Borough Council													S05	
Da	ites : 8/	6/20 -	- 8/6/20			Job Numbe	r: Q0269		Grou	nd Level :	38 Le	.82 m A.0 vel to Ordn	D.D. ance Dat	um
Lo	cation :	With	nin playin	g field		Engineer :	Capita		Coord	linates:	3301 1934	18.10 E 32.57 N		
Ŀ.	Samp	les	Samp	le Run				Strata			Co-ord	linates to Na		
om B.G.L.	Depth	Type No.	Diam. (mm)	Recovery (%)	Depth (Thick- ness)			Description				Legend	Red. Level	Water
-0	0.00 - 0.25	ES 1			-	TOPSOIL - L	ight brown sar	ndy SILT with ma	any rootlets.				A.O.D.	
-					0.25	-								
-	0.40 - 0.60	D 1			_ 0.25 _	- Firm reddish	brown silty CL	.AY.				×_×_×_ ×_×_	38.57 _	-
-	0.10 0.00	5.			-	_						<u> </u>		
-					- 0.75	-						×× ××		
-					-	-						<u> </u>	-	1
-					-	-						× 		
-1 -	1.00 - 1.20	D 2			1.00	Light brown s	andy GRAVE	L. Gravel is fine	to coarse ar	gular		0.000	37.82	
-					-	-						0 <u>0</u> 0 0 0 0 0 0 0 0 0 0		-
-					-	-						0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	-	+
-					_ 0.90	_						0 0 0 0 0 0 0 0 0 0 0 0		1
-					-	-						°0 °0 °0 °0 ? 0. °0		
-					-	-						°0 °°.0 °		
-					- 1.90 -	Terminated	pon refusal at	1 9mbal				0000	36.92	
-2					-	_	pon fordedi di						-	-
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				r. Using 87m I pit to 1.2mb		le barrel								
No	Groundwa	iter En		Dige Novaria										_
	Qua	ntui	m	Plas Newydd SA4 0FQ Tel: 01554 744880			Operator: QGL	Logged By. P Darby	Sheet No. 1 Of 1	m Per Page	metre	urements in s unless		
				Fax: email: enquiries@qua	-					5		se stated	AG	5
Form I	Name: WINDC	W SAMP	LE. Version 2.1	0.000, 28/05/13 0	Output By: S	SteffPicton. Library Fi	le: C:\USERS\PUB	LIC\DOCUMENTS\BE	NTLEY/GINT/LIB	RARIES\QUA	NTUM 4.GI	.В.		

Contract : Llantarnam 3G Pitch, Client : Torfaen County Boroug					ehole No. /S05
Dates : 8/6/20 - 8/6/20 Location : Within playing field	Job Number : Q0269 Engineer : Capita		Ground Level : Coordinates:	38.82 m A. Level to Ordi 330118.10 E 193432.57 N Co-ordinates to N	nance Datum
JOB NAME: LA JOB NUMBER: BOREHOLE NUMB BOX NUMBER: FROM (m): 010					
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		4.5.8			
	And Andrew Andrew	the second	10-1	te .	
	ALL				
Plas Newydd SA4 0FQ Tel: 01554 744880 Fax: email: enquiries@quantumgeote		P Darby 1	eet No. Of 1 2	All measurements in metres unless otherwise stated	AGS

Contract : Llantarnam 3G Pitch, CwmbranWindow Sample No.Client : Torfaen County Borough CouncilWS06														
Dates :5/6/20 - 5/6/20Job Number :Q0269Ground Level :39Location :Within playing fieldEngineer :CapitaCoordinates:33011934														
Location : Within playing field Sob Number : Q0200 Coordinates:											39 Le	.32 m A.C).D. ance Dat	ит
Lc	ocation :	With	nin playin	g field		Engineer :	Capita		Coord	linates:	3301 1934	71.71 E 76.13 N linates to Nat		
Ŀ.	Samp	les	Samp	le Run				Strata	I		0-01	indies to tvat		
om B.G.L.	Depth	Type No.	Diam. (mm)	Recovery (%)	Depth (Thick- ness)			Description				Legend	Red. Level A.O.D.	Water
-					- 0.15	TOPSOIL - Li	ight grey sand	y SILt with many	y rootlets.				-	
-	0.15 - 0.45	ES 1			- 0.15	- MADE GROU medium angu	JND - Grey an	d brown silty GF	RAVEL. Grav	/el is fine t	0		39.17	
-					0.30		nai siag conci	010.					-	
-	0.45 - 0.65	D 1			_ 0.45	– Firm reddish	brown sandy s	lightly gravelly (CLAY. Grave	el is fine to	1		38.87	
-	0.65 - 1.80	B 1			-	_ coarse angula	ar sandstone.					- <u>-</u>	-	
-					-							<u> </u>	-	
-					-	-							-	
-1					-	_							-	
1					-								-	
-					1.55	-							_	
-					-	-						<u> </u>	-	
-					-								-	
-					-	-							-	
-	1.80 - 2.00	D 2			-	-							-	
- 2					-	-							-	
-					2.00	Terminated u	pon refusal at	2.0mbgl					37.32 -	
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Equipment used: Dando Terrier. Using 87mm sample barrel								-						
Re	marks: Ha	ind exc	avated trial	I pit to 1.2mb	gl									
No	Groundwa	ter En		Plas Newydd						m D				_
	Qua	ntui		Plas Newydd SA4 0FQ Tel: 01554 744880			Operator:	Logged By.	Sheet No. 1 Of 1	m Per Page	metre	urements in s unless		
				Fax: email: enquiries@qua	intumgeotech.	co.uk	QGL	P Darby	T UT 1	5	otherw	se stated	AG	S
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Contract : Llantarnam 3G Pitch,				Borehole No. WS06
Client : Torfaen County Boroug	1			
Dates : 5/6/20 - 5/6/20	Job Number :		Ground Level :	39.32 m A.O.D. Level to Ordnance Datum
Location : Within playing field	Engineer : Ca	pita	Coordinates:	330171.71 E 193476.13 N
JOB NAM	E: LLANTARNA	1 SCHOOL	C Marco and an and	Co-ordinates to National Grid
a second and a second and a second a se	BER: 00269	10		1
		WS06		a star in the
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		Statement of the American State		
Quantum Tel: 01554 744880		erator: Logged B		All measurements in metres unless otherwise stated
Fax: email: enquiries@quantumgeotec		QGL P Darby	1 Of 1 1 age 2	otherwise stated AGS

Contract : Llantarnam 3G Pitch, CwmbranWindow Sam No.Client : Torfaen County Borough CouncilWS07										ple				
Dates :5/6/20 - 5/6/20Job Number :Q0269Ground Level :4Location :Within playing fieldEngineer :CapitaCoordinates:330193Coordinates:193193193														
Da	tes : 5/	6/20 -	- 5/6/20			Job Numbe	r: Q0269		Grou	nd Level :	40 <i>Le</i>	.36 m A.C	D.D. ance Dat	tum
Lo	cation :	With	nin playin	g field		Engineer :	Capita		Coord	linates:	1934	11.58 E 61.58 N linates to Nat	ional Grid	4
3.L.	Samp	les	Samp	ole Run	Denth	1		Strata			00 010			
om B.G.L.	Depth	Type No.	Diam. (mm)	Recovery (%)	Depth (Thick- ness)			Description				Legend	Red. Level A.O.D.	Water
-					0.25	TOPSOIL - L	ight brown sar	ndy SILT with ma	any rootlets.					
-	0.25 - 0.45	ES 1			- _ 0.25	- MADE GROU	JND - Light br	own slightly san	dy gravelly S	ILT with lo	w		40.11	
-	0.45 - 0.70	D 1			- - 0.45	Cobbles are	angular sands	ne to coarse sub tone. (Sub-soil)	-angular sai	lastone.			-	
-	0.70 - 1.00	D 2			- 0.70	- Stiff roddich k	prown silty CL	AY with occasion	al pockote (of arov silt			39.66	
-					-		m in diameter			n grey siit		<u>x</u> x *x x	-	
-1 -					-	-						 × × × ×		
-					- _ 1.10	-						*		
-					-	-						×	-	-
-					-	-						<u> </u>		
-	1.60 - 1.80	D 3			-	-						- * * - <u>* *</u> -		-
-					- 1.80 -	Torminated		1.9mbal				* <u> </u>	38.56	
-	^{1.80} Terminated upon refusal at 1.8mbgl													
-2 -					-	-								-
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Rei	narks: Ha	ind exc	cavated tria	r. Using 87m I pit to 1.2mb		le barrel								
No	Groundwa	iter En		Plas Newydd			0	x 15	01	m Per				
$ \langle$	Qua	ntui	m	SA4 0FQ Tel: 01554 744880 Fax:			Operator: QGL	Logged By. P Darby	Sheet No. 1 Of 1	Page	metre	urements in s unless se stated	AG	S
											_B.	n M	•	

Contract : Llantarn Client : Torfaen Co								Borehole No. WS07
Dates : 5/6/20 - 5/6/20	anty Dorotagi	Job Numbe	r · 00269		Grour	d Level :	40.3	6 m A.O.D.
Location : Within playir	ng field	Engineer :			Coord	inates:	33021 19346	
	BOREHC BOX NUI FROM (m	MBER: DLE NUMBE MBER: 1	R: OF: TO (m	1573 1 1.8				
Quantum	Plas Newydd SA4 0FQ Tel: 01554 744880 Fax: email: enquiries@quantumgeotec	h.co.uk	Operator: QGL	Logged By. P Darby	Sheet No. 1 Of 1	m Per Page 2	All measure metres t otherwise	inless

													w Sam No.	ıple
Dates : 5/6/20 - 5/6/20Job Number : Q0269Ground Level :Location : Within playing fieldEngineer : CapitaCoordinates: 33													S08	
Da	ites : 5/	6/20 ·	- 5/6/20			Job Numbe	r: Q0269		Grou	and Level :	: 40 Le	.46 m A.C		um
Lo	cation :	With	nin playir	ng field		Engineer :	Capita		Coor	dinates:	1934	25.59 E 55.84 N dinates to Nat	ional Gria	ł
Ŀ.	Samp			ple Run	Dopth	1		Strata	•					
om B.G.L.	Depth	Type No.	Diam. (mm)	Recovery (%)	Depth (Thick- ness)			Description				Legend	Red. Level A.O.D.	Water
- 0					0.10			tly sandy SILT w own slightly san			olic		40.36	
-	0.20 - 0.40	ES 1			_ 0.10			stone (Sub-soil)		SILT. Glav			-0.50	
-					- _ 0.50	-							-	
-					-	-							-	
-	0.60 - 1.60	B 1			0.60 - -	Stiff reddish t grey Silt (app sandstone.	prown slightly rox. 0.05m in	gravelly CLAY w diameter). Grav	vith occasio vel is fine to	nal pockets coarse ang	s of gular		39.86 _	-
- -1	1.00 - 1.20	D1			-	-							-	
- '	1.00 1.20	5,			1.00	-						ō	-	
ŀ					Ł	-							-	
-					-	-							-	
-					-	-								
-					- <u>1.60</u> -	Terminated u	pon refusal at	1.6mbgl					38.86	
ŀ						ł							-	
-2					-	-							-	
					-	-							-	
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Equipment used: Dando Terrier. Using 87mm sample barrel Remarks: Hand excavated trial pit to 1.2mbgl														
No Groundwater Encountered														
	Qua	ntu	m	SA4 0FQ Tel: 01554 744880 Fax: email: enquiries@qua	antumgeotech.	.co.uk	Operator: QGL	Logged By. P Darby	Sheet No. 1 Of 1	m Per Page 5	metre	urements in s unless ise stated	AG	S
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Contract : Llantarnar	n 3G Pitch, Cw	mbran				Borehole No.
Client : Torfaen Cour	nty Borough Co	ouncil				WS08
Dates : 5/6/20 - 5/6/20	Jo	b Number : Q0269		Ground Level :	40.46 Level	m A.O.D. to Ordnance Datum
Location : Within playing	field Er	ngineer : Capita		Coordinates:	330225. 193455.	84 N
	JOB NAME: JOB NUMBER BOREHOLE NU BOX NUMBER: FROM (m):	LLANTARN M SCHOO COOZER IMBER: WSO	a 1 1.6		193455. Co-ordina	
	ail: enquiries@quantumgeotech.co.uk	Operator: QGL	P Darby	Sheet No. 1 Of 1 2	All measurem metres un otherwise s	ess

Contract : Llantarnam 3G Pitch, Cwmbran Client : Torfaen County Borough Council												Windov N	w Sam No.	ple
Dates : 5/6/20 - 5/6/20Job Number : Q0269Ground Level :Location : Within playing fieldEngineer : CapitaCoordinates: 33 19													S09	
D٤	ites : 5/	6/20 -	- 5/6/20			Job Numbe	r: Q0269		Grou	nd Level :	40 Le	.36 m A.C		um
Lo	cation :	With	nin playin	g field		Engineer :	Capita		Coord	linates:	3302 1934	33.38 E 47.49 N linates to Nat		
G.L.	Samp			le Run	Depth			Strata					Red.	
om B.G.L.	Depth	Type No.	Diam. (mm)	Recovery (%)	(Thick- ness)			Description				Legend	Level A.O.D.	Water
-	0.00 - 0.20	ES 1			0.20	TOPSOIL - Li	ight brown sar	ndy SILT with ma	any rootlets.				-	
-					0.20 - _ 0.30			own slightly sand to sub-angular		ILT. Grave	el is		40.16	
-	0.55 - 1.60	B 1			0.50 - 0.05	Orangeish br	own gravelly S	SAND. Sand is fi	ine. Gravel is	fine to m	edium /			
- - -1	1.00 - 1.10	D 1			- 0.55 - -	- Firm to stiff re	eddish brown s m-0.10m in di	silty CLAY locall ameter).	y with pocke	ts of grey s	/ sand	× × × × × × × × × × × × × × × × × × ×		
-					- 1.05 - - -	-						× ×× *× *× *× x× *×	-	
-					- <u>1.60</u> ·	Terminated u	pon refusal at	1.6mbgl				<u>xx</u>	38.76	
- 2 -						-							-	
-					-	-							-	
-3 - -					- - -	-							-	
-					- - -	-							- - -	-
-4 - -					- - -	- - -							-	
-					- - -	-							-	
Re	marks: Ha	ind exc	cavated trial	r. Using 87m I pit to 1.2mb		le barrel								
No Groundwater Encountered Plas Newydd Operator: Logged By. Sheet No. m Per Page 1 Of 1 All measurer metres ur otherwise st Form Name: WINDOW SAMPLE. Version 2.10.000, 28/05/13 Output By: SteffPicton. Library File: C:\USERS\PUBLIC\DOCUMENTS\BENTLEY\GINTLIBRARIES\QUANTUM 4.GLB. All measurer										s unless se stated	AG	S		

Contract : Llantarnam 3G P	itch, Cwmbran				Borehole No.
Client: Torfaen County Bo	rough Council				WS09
Dates : 5/6/20 - 5/6/20	Job Number : Q02	269	Ground Level	Le	.36 m A.O.D. vel to Ordnance Datum
Location : Within playing field	Engineer : Capita		Coordinates:	19344	33.38 E 47.49 N
JOB JOB BORE BOX FROM	NAME: LLANTARN MISS NUMBER: 00269 HOLE NUMBER: 0 NUMBER: 105:	Hool 1509 1-6 1-6		1934 <u></u> Co-ora	47.49 N linates to National Grid
Plas Newydd SA4 0FQ Tel: 01554 744880 Fax: email: enquiries@qr		P Darby	Sheet No. m Per Page 1 Of 1 2	metres	rements in sunless se stated

Client : Torfaen County Borough Council											Windo	w San No.	ple	
C	Dates :8/6/20 - 8/6/20Job Number :Q0269Ground Level :38Location :Within playing fieldEngineer :CapitaCoordinates:33011933													
Da	ites : 8/	6/20 -	- 8/6/20			Job Numbe	r: Q0269		Grou	nd Level :	38 Le	.49 m A.C vel to Ordn		um
Lo	cation :	With	nin playin	g field		Engineer :	Capita		Coord	linates:	3301 1933	91.76 E 81.11 N linates to Nat		
Ŀ.	Samp	les	Samp	ole Run	Denth	1		Strata	•					
om B.G.L.	Depth	Type No.	Diam. (mm)	Recovery (%)	Depth (Thick- ness)			Description				Legend	Red. Level A.O.D.	Water
-0 -					0.20	TOPSOIL - L	ight grey sligh	tly sandy SILT w	ith many roo	otlets.			-	
-	0.20 - 0.40	ES 1			0.20			own slightly sand					38.29	
-					- - 0.40	fine to coarse	e sub-rounded	to angular sand	stone and b	rick. (Sub-	SOII)			
	0.60 - 0.80	D 1			-	_							-	
-					0.60 -	Firm reddish (approx. 0.05	brown silty CL m in diameter	AY with occasio	nal pockets	of black si	lt	× × - × × × ×	37.89	
-					-	-						× * × *	-	
-1					_ 0.70	-						^ <u>~</u>	-	
-					-	-						ׯ×~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		1
-					1.30			clayey sandy GR	AVEL. Grav	el is fine to)	^ <u>x ^ x</u> 0 <u></u> 0 <u></u> _ 0	37.19	-
-					-	coarse angula	ar sandstone.					0 A 0 A	-	1
-					_ 0.50	-						0.0-0-0		
-					- 	Torminated	pon refusal at	1 9mbal				; <u>~</u> ; ,	36.69	
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-			and T i	- 11-1 AT	-								-	
Equipment used: Dando Terrier. Using 87mm sample barrel Remarks: Hand excavated trial pit to 1.2mbgl														
Nro	o Groundw	ater Er	ncountered	Plas Newydd			Oneret	LagradD	Chert M	m Per		I		•
	Qua	ntui	n	SA4 0FQ Tel: 01554 744880 Fax:			Operator: QGL	Logged By. P Darby	Sheet No. 1 Of 1	Page	metre	urements in s unless ise stated	AG	S
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Contract : Llantarna Client : Torfaen Cou						ehole No. /S10
Dates : 8/6/20 - 8/6/20 Location : Within playing	j field Engi	Number : Q0269 neer : Capita		Ground Level : Coordinates:	38.49 m A. Level to Ordi 330191.76 E 193381.11 N Co-ordinates to No	ance Datum
	OB NAME: LAN OB NUMBER: OREHOLE NUMBE OX NUMBER: 1 ROM (m): 0.0	0269				
	as Newydd Ad OFQ sl: 01554 744880 ax: nail: enquiries@quantumgeotech.co.uk 2010U1192.881ES1011AHT1114_6118_Ecom	Operator: QGL	P Darby	Sheet No. 1 Of 1 2	All measurements in metres unless otherwise stated	AGS

Client : Torfaen County Borough Council											Windov I	w San No.	ıple	
C	Dates :8/6/20 - 8/6/20Job Number :Q0269Ground Level :3Location :Within playing fieldEngineer :CapitaCoordinates:330193													
Da	ites : 8/	6/20 -	- 8/6/20						38 Le	.44 m A.0 vel to Ordn		tum		
Lo	cation :	With	nin playin	g field		Engineer :	Capita		Coord	linates:	1933	64.87 E 52.17 N linates to Nat	tional Grid	d
і. Э.	Samp			le Run	Denth	1		Strata						
om B.G.L.	Depth	Type No.	Diam. (mm)	Recovery (%)	Depth (Thick- ness)			Description				Legend	Red. Level A.O.D.	Water
-					0.20	TOPSOIL - L	ight brown sar	ndy SILT with ma	any rootlets.					-
-	0.20 - 0.40	ES 1			0.20 - -	MADE GROU fine to coarse	JND - Light bro sub-rounded	own slightly sand sandstone.	dy gravelly S	ILT. Grave	el is		38.24	-
-					_ 0.50	-								
	0.70 - 0.90	D1			0.70	Soft to firm re	eddish brown s	lightly sandy silf	ty CLAY.			<u>× · × · · · </u> ×	37.74	1
-					_ 0.30	-						×× × ×- × ×- × ×	-	-
1 - - -	1.00 - 2.50	B 1			1.00 - - -	Reddish brov Gravel is fine - - -	vn slightly silty to coarse ang	slightly silty gra jular sandstone.	velly SAND.	Sand is fir	ne.		37.44	• • • •
-					_ _ 1.50 -	-						× · · · × · o · × · · o · × · · · × · · · × · · · ×		-
-2 - - -					- - - -	- - - -						~ × · · × · · × · · × · · × · · × · · · × · · × · · × · · × · · × · · · · × · · · × · · · · × · · · · × · · · · × · · · · × · · · · × · · · · · × · · · · · × · · · · · · · · · · × ·	· · ·	• 🛓
- - - - - -						Terminated u	ipon refusal at	2.5mbgl					35.94	-
-					- - -	- - -								-
-					-	-								-
-4 - -					-	-								-
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-					-	-								-
Equipment used: Dando Terrier. Using 87mm sample barrel												-		
				r. Using 87m I pit to 1.2mb		le barrel								
	Plas Newydd SA4 0FQ Operator: Logged By. Sheet No. m Per Page All measuren metres ur otherwise statutes Verm Name: WINDOW SAMPLE Version 2 10 000 - 28/05/13 Output By: StaffPicton Library Elle: CN ISERSPILIE IC/DOCI MENTS/BENTI EXCIDENTI BRAPIES/OLIANTI M 4 GLB All measuren metres ur otherwise statutes										s unless ise stated	AG	I S	

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Contract : Llantarn							E	Borehole No. WS11
Client : Torfaen Co	ounty Boroug					1		
Dates : 8/6/20 - 8/6/20		Job Numbe				nd Level :	Level to	A.O.D. Ordnance Datum
Location : Within playin	ng field	Engineer :	Capita		Coord	inates:	330164.87 193352.17	' N
JOB		R: WS OF: TO (m):	11					o National Grid
								And the transferred and the
	Plas Neworld					m Day		
Quantum	Plas Newydd SA4 0FQ Tel: 01554 744880 Fax: email: enquiries@quantumgeote	ch.co.uk	Operator: QGL	Logged By. P Darby	Sheet No. 1 Of 1	m Per Page 2	All measurement metres unless otherwise state	

					Cwmbran Council							w San No. ' <mark>S12</mark>	npl
tes : 9/ cation :		· 9/6/20 iin playin	g field		Job Numbe Engineer :				nd Level linates:	<i>Le</i> 3302 1933	.31 m A.0 <i>wel to Ordn</i> .05.34 E .61.13 N	ance Da	
Samp	les	Samp	le Run				Strata			Co-ord	dinates to Na	tional Gri	
Depth	Type No.	Diam. (mm)	Recovery	Depth (Thick-			Descriptior	ı			Legend	Red. Level	Mator
Depth 1.20 - 1.40 1.60 - 2.00 2.00 - 2.50		(mm)	(%)	(Thick- ness) - 0.20 - 0.40 	MADE GROU fine to coarse Firm to stiff re Firm to stiff re SAND. Grave	UND - Light bro e sub-rounded eddish brown s wn and orange el is fine to coa	idy SILT with m own slightly san to sub-angular. silty CLAY.	any rootlets.			Legend	Level A.O.D. 38.11 37.71	
Reddisi Reddisi 						brown below 2	-					- 35.31	
			r. Using 87m I pit to 1.2mb		- - - - - - - - - - - - - - - - - - -							-	
Qua		n	Plas Newydd SA4 0FQ Tel: 01554 744880 Fax: email: enquiries@qua			Operator: QGL	Logged By. P Darby	Sheet No. 1 Of 1	m Per Page 5	metre otherw	urements in s unless ise stated	AG	ı S

Contract: Llantarnam 3G Pitch	, Cwmbran					ehole No.
Client : Torfaen County Boroug	Ih Council				V	VS12
Dates : 9/6/20 - 9/6/20	Job Number : Q0269)		l Level :	38.31 m A Level to Ord	.O.D. nance Datum
Location : Within playing field	Engineer : Capita		Coordi	nates:	330205.34 E 193361.13 N Co-ordinates to N	
JOB NUMBE BOREHOLE N BOX NUMBER FROM (m):	UMBER: WS12					
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	All and a second	(in The second			the start	
All Queen		and Corners	No. 1 Mar			
18	Autor and	A MARINE		4		
		A MICH CARD	-	1	a torar	
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A DECES	Store Th					
		4143		C. Designation		
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Contract : Llantarnam 3G Pitch, Cwmbran Window Sami No. Client : Torfaen County Borough Council WS13 Dates : 9/6/20 - 9/6/20 Job Number : 00269 Ground Level : 38.24 m A.O.D.												ple		
C	lient :	Torf	aen Co	unty Bor	ough	Council								
Dates :9/6/20 - 9/6/20Job Number :Q0269Ground Level :Location :Within playing fieldEngineer :Capita													D.D. ance Data	ит
Lo	cation :	With	nin playin	g field		Engineer :	Capita		Coor	dinates:	1933	22.88 E 48.21 N dinates to Nat	ional Gria	,
Ŀ.	Samp	les	Samp	ole Run				Strata	I		0-01	unates to tvat		
om B.G.L.	Depth	Type No.	Diam. (mm)	Recovery (%)	Depth (Thick- ness)			Description				Legend	Red. Level A.O.D.	Water
-					_ 0.10			dy SILT with ma own slightly san			with		- 38.14	
-					_ 0.10 ⁻ 0.40 -	Iow to mediur	n cobble conte	ent. Gravel is fin o-angular sands	e to coarse	sub-angul	ar			
-					0.50 - -	Soft to firm re	ddish brown s	lightly sandy CL	.AY.				37.74 -	
- -1					-	-							-	
-	1.20 - 1.40	D 1			- 1.10 - -	-							-	
-					_	L								
-	1.60 - 2.00	B 2			1.60	Grevish brow	n slightly clave	y slightly gravel	IIV SAND. S	and is fine			36.64	
-					-	Gravel is fine	to coarse sub	-rounded to sub	b-angular sa	andstone.		- ·· · ··a ·	-	
-		^{0.40} ^{2.00} Terminated upon refusal at 2.0mbgl										-		
-2 -	2 2.00 Terminated upon refusal at 2						2.0mbgl				. . a	36.24		
-		2.00 I erminated upon refusal at 2.0mbgl									_			
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Rei	m arks: Ha	ind exc	cavated tria	r. Using 87m I pit to 1.2mb		L le barrel						11		L
No	No Groundwater Encountered													
	Qua	ntu	m	SA4 0FQ Tel: 01554 744880 Fax:	intumaaataak	couk	Operator: QGL	Logged By. P Darby	Sheet No. 1 Of 1	m Per Page 5	metre	urements in s unless ise stated	AG	S
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cation ; Within playing field Primer ; Capita Durdinuter ; 202282 22. Barter of the Number : Conference of the Number : Conferen	ates : 9/6/20 - 9/6/20)	Job Number : Q0269	Ground Level :	38.24 m A.O.D. Level to Ordnance Data
JOB NUMBER: 00259 BOREHOLE NUMBER: 0518 BOX NUMBER: 1 OF: FROM (m): 12 TO (m): 20	ocation : Within play	ing field	Engineer : Capita	Coordinates: 33	0222.88 E 3348.21 N
BOX NUMBER: OF: FROM (m): 12 TO (m): 20	JO		and the second se		ordinares to runoral ordi
	AND INCOME AND ADDRESS OF THE OWNER OWNER OF THE OWNER	and the second			A STATE
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		Europic and the		CONTRACTOR OF	Ser -

C	Contract : Llantarnam 3G Pitch, Cwmbran Win													iple		
C	lient :	Torf	aen Co	unty Bor	ough	Council							No. 1814			
Da	ates : 8/	6/20 ·	- 8/6/20			Job Numbe	r: Q0269	38 Le	.35 m A.C	D.D. ance Dat	um					
Lo	cation :	With	nin playin	g field		Engineer :	Capita		Coord	dinates:	3301 1933	91.83 E 58.81 N				
Ŀ.	Samp	les	Samp	le Run				Strata			Co-ore	dinates to Nat	ional Grid			
om B.G.L.	Depth	Type No.	Diam. (mm)	Recovery (%)	Depth (Thick- ness)			Description				Legend	Red. Level A.O.D.	Water		
-					0.20	TOPSOIL - L	TOPSOIL - Light brown sandy SILT with many rootlets.									
-					0.20		own slightly san to sub-angular.		SILT. Grave	el is		38.15 -				
-	0.50	В1			- - -	-										
-					0.60	Firm reddish	brown silty CL	AY.				×× *×	37.75 -			
-					- 0.60	-						<u> </u>	-			
-1 -					-	-						×× *× ××	-			
-	1.20	D 2			1.20	Light brown a sandstone.	and brown san	dy GRAVEL. Gr	avel is fine t	o coarse a	ingular	- <u>×</u> <u>×</u>	37.15 .			
-					_ 0.30	-						0 <u>0</u> . 0 <u>0</u> . 0 0 0.0				
-					1.50 -	l erminated u	pon refusal at	1.5mbgl					36.85			
-					-	-							-			
-2					_	_							-			
-					-	-							-			
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-					-	-							-			
-					-	-							-			
-	uinmont		ando Torrio	r. Using 87m	-								-			
				l pit to 1.2mb												
No	Groundwa	ater En														
	Qua	ntu	m	Plas Newydd SA4 0FQ Tel: 01554 744880 Fax:		ao uk	Operator: QGL	Logged By. P Darby	Sheet No. 1 Of 1	m Per Page 5	metre	urements in s unless ise stated	AG	S		
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ontract: Llantarnam 3G lient: Torfaen County Bo			Borehole No WS14
ates : 8/6/20 - 8/6/20	Job Number : Q0269	Ground Level :	38.35 m A.O.D. Level to Ordnance Data
ocation : Within playing field	Engineer : Capita	Coordinates: 33	Devel to Oranance Data 0191.83 E 3358.81 N ordinates to National Grid
JOB N	NUMBER: CO259	- in the second	
BORE	HOLE NUMBER: WS14	A A A A	
The second second	UMBER: OF:		in the second
FROM	(m): 1-2 TO (m): 1-5		
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C	Contract: Llantarnam 3G Pitch, Cwmbran Window S														ple
C	Client : Torfaen County Borough Council														
Da	ntes : 9/	6/20 ·	- 9/6/20			Job Numbe	er: Q0269		(Ground Leve	1: 38 Le	.28 m A vel to Ord). e Dat	um	
Lo	cation :	With	nin playin	g field		Engineer :	3302 1933	13.80 E 22.96 N	E J						
ų	Samp	les	Samp	le Run				Strata			Co-ord	dinates to		al Gria	t
om B.G.L	Depth	Type No.	Diam. (mm)	Recovery (%)	Depth (Thick- ness)		De	Legend	Red. Level A.O.D.	Water		tall/ ckfill			
- 0					0.20	TOPSOIL - L	ight brown sai	ndy SILT with ma	any roo	tlets.		-		D.Q Q	Δ ∇ ∇ ∇
-					0.20 - - 0.45	with low cobb	ole content. Gr	own slightly sand avel is fine to co b-rounded sand	barse su	ub-rounded		38.08 _			
-					- _ 0.65	- -	brown ailty Cl					37.63			
- - 1					-	- Firm redaisn - -	brown silty CL	AT.			^xx *x xx xx *x *x				
-	1.20 - 1.40	D 1			- 0.95 -	-					XX *XX ~_XX XX XX XX XX		-		
-	1.60 - 1.90	D 2			-	-									
-		51			1.60 - _ 0.30	-		ID. Sand is fine.				36.68			
-2 -					1.90 - -	sub-rounded	rey sandy GR/ to angular sai y from 1.90 - 4		fine to o	coarse	0.000 0.000 0.000				
-					- - -	No Recovery	-						-		
- - -3					- - _ 2.10 -	-						-	-		
-					- - -	⁻ No Recovery - - -	,					-	-		
- - 4					- - - <u>4.00</u> -	- - Terminated u	ipon refusal at	t 4.0mbql			0 0 0 0 0 0 0 0 0 0 0 0 0 0 0				
-					-	-		-				- - -	-		
-					-	- -						- -	-		
-					-	-									
Rei	marks: Ha	ind exc	cavated trai	r. Using 87m I pit to 1.2mb		le barrel									
No	Groundwa	iter En		Plas Newydd									—		
	Qua	ntui	m	Plas Newydd SA4 0FQ Tel: 01554 744880 Fax: email: enquiries@qua	ntumgeotech	co.uk	Operator: QGL	Logged By. P Darby	Sheet 1 Of	Page	metre	urements ir s unless ise stated		AG	S
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KEY TO BOREHOLE AND TRIAL PIT LOGS

m.A.O.D. metres Above Ordnance Datum.

SAMPLE AND TEST TYPES

- U Undisturbed driven tube sample 102mm diameter, 450mm long.
- P Undisturbed pushed piston sample 102mm diameter, 1000mm long.
- **TW** Undisturbed thin walled push in sample 100mm diameter, 750mm long.
- B Bulk disturbed sample.
- BLK Block Sample
- **CBR** Heavy duty undisturbed sample 154 mm diameter (CBR mould).
- D Small disturbed sample.
- LB Large Bulk disturbed sample (for earthworks testing)
- c Core sample
- Water sample
- G Gas sample
- **ES** Environmental sample (soil)
- j Jar sample
- t Tub sample
- P Pot sample
- s Small sample
- v Vial sample
- **S** Standard Penetration Test using split spoon sampler. (See Note).
- **C** Standard Penetration Test using a solid 60 degree cone. (See Note).

NOTE: Where a single value is quoted this is the N value for 300 mm penetration following a seating drive of 150 mm. Where this full penetration is not achieved the number of blows is quoted for the penetration below the seating drive eg. 63/160 mm. Where total penetration is less than the seating drive this is indicated by a + and the number of blows for total

- **HV** Hand Vane Test. Vane undrained shear strength, c_{μ} , quoted in kPa.
- **V** Borehole Vane Test. Vane undrained shear strength, c_{μ} , quoted in kPa.
- FHT/RHT Falling / Rising Head Permeability Test.

penetration is quoted eg. +50/75 mm.

CORE RUN DETAILS

- TCR Total Core Recovery, %
- SCR Solid Core Recovery, %
- RQD Rock Quality Designation, %
- **FI** Fracture Index. NI Non intact where > 25 No. per metre length.

WATER COLUMN SYMBOLS

- First water strike, second water strike etc.
- $\frac{1}{2}$ $\frac{2}{2}$ Standing water level after first strike, second strike etc.
 - Seepage.



KEY TO BOREHOLE AND TRIAL PIT LOGS

MATERIAL LEGENDS Made Ground Topsoil Clay Sand Silt Gravel Peat **Boulders** Cobbles \cap 0 0 Ď.Ď 00 Volcaniclastic Chalk Conglomerate Mudstone Void Asphalt Siltstone Sandstone Limestone Mudstone / $\triangle \Delta$ Ironstone Breccia Siltstone Δ Δ -Ċ ÷Ċŕ Coal Coral ¢ Bedrock ö Igneous Shale Gypsum (Coarse Grained) Igneous Igneous Metamorphic (Fine Grained) (Medium Grained) (Coarse Grained) Metamorphic Metamorphic (Fine Grained) (Medium Grained)

INSTALLATION / BACKFILL DETAILS



Arisings





Bentonite seal



Plain pipe



0.0

Slotted pipe

Concrete

Filter



Bentonite cement grout



Pea Gravel



Piezometer / Standpipe tip





APPENDIX IV – DYNAMIC PROBE RESULTS

Contract : Llantarnam 3G Pitch, Cwmbran														nic Probe						
Clie	nt :	Т	orfa	aen	Со	unty	Boro	ugh C	ounc	il										P01
Dates									ob Nur								d Level :	Le		O.D. ance Datum
Loca	tion	: V	Vith	in pl	layir	ng field		E	Inginee	er: C	Capita	l				Coordi	nates:	1935	92.27 E 25.76 N linates to Na	tional Grid
Depth	(R Blows	eadir s / 10	ng)0mm	ר)			BL	OW C	оил	Г (N10	0 V/	ALUE	ES)			Torque (Nm)		Rema	
(11)	(iii) <u>1 2 3 4 5 5 10 15 20</u> 2 2								0	25 30 35 40				15						
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Test ca	rried o	ut in a	ccord	ance	with B	S 1377 (1 Plas Newydd		9, Sect.3.	2				•	1.5	01		m Per			
										Operato QG	perator: Logged By. Sheet No. m Per Page All measurements metres unless otherwise stated QG P Darby 1 Of 1 10 10						s unless	AGS		

Form Name: DYNAMIC PROBE. Version 2.10.000, 29/04/13 Output By: SteffPicton. Library File: C:\USERS\PUBLIC\DOCUMENTS\BENTLEY\GINT\LIBRARIES\QUANTUM 4.GLB.

Contract : Llantarnam 3G Pitch	Dynamic Probe											
Client : Torfaen County Boroug	gh Council				Level :	DP02						
Dates : 8/6/20 - 8/6/20	Job Numbe			39.77 m A.O.D. Level to Ordnance Datum								
Location : Within playing field	Engineer :	Capita		Coordin	19	30054.25 E 93476.63 N 'o-ordinates to National Grid						
Depth (Blows / 100mm)	BLOW COUN	LOW COUNT (N100 VALUES) Torque										
(III) <u>1</u> 2 3 4 5 5 10 <u>2</u> 2 4 5 5 10	15 20	25 30	35 40	45	(Nm)	Remarks						
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-9.0												
9.5												
Equipment: Dando Terrier Rig Test carried out in accordance with BS 1377 (1990):Part 9,	Sect 3.2	Com	ments:									
Plas Newyd SA4 OFQ Tet: 01554 744880	UTUI.J.Z	Operator:	Logged By.	Sheet No.	m Per Page All n	neasurements in netres unless						
Fax: email: enquiries@quantumgeo	tech.co.uk	QG	P Darby	1 Of 1	10 ot	herwise stated						

Form Name: DYNAMIC PROBE. Version 2.10.000, 29/04/13 Output By: SteffPicton. Library File: C:\USERS\PUBLIC\DOCUMENTS\BENTLEY\GINT\LIBRARIES\QUANTUM 4.GLB.

Contract : Llantarnam 3G Pitch, Cwmbran Dy														-	nic Probe					
Clie	nt :	Т	orfa	aen	Co	ounty	Boro	ugh C	counc	il									D	P03
Date									ob Nur)				Level :	Le		O.D. ance Datum
Loca	tion	: V	Vith	in p	layir	ng field	1	E	Enginee	er: (Capi	ta				Coordii	nates:	1934	41.57 E 36.18 N linates to Na	tional Grid
Depth (m)	Depth (m) Reading (Blows / 100mm) BLOW COUN 1 2 3 4 5 10 15 20										(Ni							ue Remarks		
Depth (m) 0.5 1.0 1.5 2.5 3.0 3.5 -4.0 4.5 -5.5 -6.0 -6.5 -7.0 -7.0 -7.5 -8.0 8.5		Blow	s / 10	DŌmn	· · · · ·											5	Torque (Nm)		Rema	rks
- 9.0 							 			 										
9.5 							 			 										
Equipment: Dando Terrier Rig											Corr	nments								
												501		-						
	Test carried out in accordance with BS 1377 (1990):Part 9, Sect.3.2 Plas Newydd SA4 0FQ Tel: 01554 744880 Fax: email: enquiries@quantumgeotech.co.uk									Oper Q			<mark>ged By</mark> . Darby	Sheet 1 O	110.	m Per Page 10	metre	irements in s unless se stated	AGS	

Form Name: DYNAMIC PROBE. Version 2.10.000, 29/04/13 Output By: SteffPicton. Library File: C:\USERS\PUBLIC\DOCUMENTS\BENTLEY\GINT\LIBRARIES\QUANTUM 4.GLB.

Con	tra	ct :	LI	ant	arn	am 3	G Pito	:h, Cv	vmbra	an									-	nic Probe
Clie	nt :	Т	orfa	aen	Со	unty	Boro	ugh C	ounc	il									D	P04
Date									ob Nur								l Level :	Le		O.D. ance Datum
Loca	tion	: V	Vith	in pl	layir	ng field		E	Inginee	er: (Capit	а				Coordi	nates:	1933	88.20 E 98.89 N linates to Na	tional Cuid
Depth		R Blow	eadii	ng	2)			BL	ow co	OUN	Г (N1	00 V	ALUE	S)			Torque		Rema	
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Equipment: Dando Terrier Rig Comments:																				
Test carried out in accordance with BS 1377 (1990):Part 9, Sect.3.2																				
Plas Newydd SA4 0FQ Tel: 01554 74480 Fax: enail: enquiries@quantumgeotech.co.uk										Opera QC			<mark>ged By</mark> . Darby	Shee 1 C		m Per Page	metre	urements in s unless se stated	A C S	
	\ '					email: enqui	ries@quantur	ngeotech.co.ul	c .				1		1		10			

Con	tra	ct :	LI	ant	arn	am 3	G Pito	ch, Cv	vmbra	n									nic Probe
Clie	nt :	Т	orf	aen	Со	unty	Boro	ugh C	ounci	I								D	P05
Dates									ob Nur			9				Level :	Le		O.D. ance Datum
Loca	tion	: \	Vith	in p	layir	ng field	1	E	Engineer	:: C	apita				Coordii	nates:	1934	18.10 E 32.57 N dinates to Na	tional Grid
Depth (m)	(Blow)Ōmn	-		5 1		. OW CO 5 20		(N100) 25 3		ES) 5 40) 4	5	Torque (Nm)		Rema	arks
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2.0	9	9	8																
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-																			
9.5																			
Equipment: Dando Terrier Rig												mments							
							990):Part	9, Sect.3	.2										
	Test carried out in accordance with BS 1377 (1990):Part 9, Sect.3. Plas Newydd SA4 0FQ Tel: 01554 744800 Fax: email: enquiries@quantumgeotech.co.ul									(Operator: QG		<mark>ged By</mark> . Darby	Shee 1 C		m Per Page 10	metre	urements in s unless ise stated	AGS

Form Name: DYNAMIC PROBE. Version 2.10.000, 29/04/13 Output By: SteffPicton. Library File: C:\USERS\PUBLIC\DOCUMENTS\BENTLEY\GINT\LIBRARIES\QUANTUM 4.GLB.

Con	tra	ct :	LI	ant	arn	am 30	G Pito	ch, Cv	vmbra	an										nic Probe
Clie	nt :	: T	orfa	aen	Co	unty	Boro	ugh C	counc	il										P06
Dates									ob Nu)				l Level :	Le		O.D. aance Datum
Loca	tion	: V	Vith	in p	layir	ng field		E	Enginee	er:	Capi	ta				Coordi	nates:	1934	71.71 E 76.13 N <u>linates to Na</u>	utional Grid
Depth	(R Blow	eadir	ng)0mn	n)			BL	.OW C	OUN.	T (N1	00 V	ALUE	S)			Torque		Rema	
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- 9.5 -										i I						i I				
Equipment: Dando Terrier Rig													nments	:		!				
	Test carried out in accordance with BS 1377 (1990):Part 9, Sect.3.2																			
	Plas Newydd SA4 0FQ Op								Oper Q			g <mark>ed By</mark> . Darby		et No. Of 1	m Per Page 10	metre	urements in s unless ise stated	ACES		

Con	tra	ct :	LI	ant	arn	am 30	G Pit	ch, Cv	vmbrar	า								-	nic Probe
Clie	nt :	Т	orfa	aen	Со	unty	Boro	ugh C	Council										P07
Dates									ob Num)				Level :	Le		O.D. aance Datum
Loca	tion	: V	Vith	in p	layir	ng field		I	Engineer	: Ca	pita				Coordir	nates:	1934	11.58 E 61.58 N linates to Na	tional Grid
Depth (m)	(R Blows	eadir s / 10 3	ng)0mm 4	n) 5	ţ	5		OW CO	UNT (I 25	V100 V 30			4	5	Torque (Nm)		Rema	
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	8	8	9	9															
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Equip											Con	nments	:						
										erator: QG		<mark>ged By</mark> . Darby	Shee 1 C		m Per Page 10	metre	urements in s unless se stated	AGS	

Form Name: DYNAMIC PROBE. Version 2.10.000, 29/04/13 Output By: SteffPicton. Library File: C:\USERS\PUBLIC\DOCUMENTS\BENTLEY\GINT\LIBRARIES\QUANTUM 4.GLB.

Con	tra	ct:	LI	ant	arn	am 3	G Pito	ch, Cv	vmbra	n									nic Probe
Clie	nt :	Т	orf	aen	Co	unty	Boro	ugh C	Counci	I								D	P08
Dates									ob Nur			9				Level :	Le		O.D. ance Datum
Locat	tion	: V	Vith	in p	layir	ng field	1	F	Engineer	r: C	apita			'	Coordir	nates:	1934	25.59 E 55.84 N <u>linates to Na</u>	tional Grid
Depth (m)	(E	Blow)Ōmn	-		5 1		. OW CC				ES) 5 40) 4:	5	Torque (Nm)		Rema	ırks
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Equipment: Dando Terrier Rig																			
							990)·Part	9. Sect 3	.2			mments							
	est carried out in accordance with BS 1377 (1990):Part 9, Sect.3.2 Plas Newydd SA4 0FQ Tel: 01554 744880 Fax: email: enquiries@quantumgeotech.co.uk									Operator: QG		g <mark>ed By</mark> . Darby	Sheet 1 O		m Per Page 10	metre	urements in s unless ise stated	AGS	

Form Name: DYNAMIC PROBE. Version 2.10.000, 29/04/13 Output By: SteffPicton. Library File: C:\USERS\PUBLIC\DOCUMENTS\BENTLEY\GINT\LIBRARIES\QUANTUM 4.GLB.

Contract : Lla	antarn	am 3G	Pitch, Cv	vmbran										nic Probe
Client : Torfa	en Co	ounty Bo	orough C	Council									D	P09
Dates : 5/6/20 -				ob Numb							Level :	Le		D.D. ance Datum
Location : Within		ng field	E	Engineer :	Cap	ita			C	oordin	ates:	1934	33.38 E 47.49 N <i>linates to Na</i>	tional Grid
Depth (m) Reading (Blows / 100)	g 0mm) 4 5	5		OW COU	NT (N ⁴ 25	100 V 30	ALUES	S)	45		Torque (Nm)		Rema	rks
	6 2 2													
-1.0 <u>2</u> <u>4</u> <u>4</u>	4													
- 1.5 <u>3</u> <u>3</u> <u>3</u> <u>3</u> <u>3</u> <u>3</u> <u>3</u> <u>3</u> <u>3</u> <u>3</u>	4 6 3													
2.0 <u>3</u> 5 9	11													
2.5 4 4 5	6													
-3.0 <u>5</u> <u>3</u> <u>3</u>	5 7]											
	3 4													
-4.0 9 10 50	4 6													
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7.5														
- 7.5 														
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Equipment: Dando To				••		Com	ments:							
Test carried out in accorda		S 1377 (1990 Plas Newydd SA4 0FQ):Part 9, Sect.3	.2	0.000	ator	Loca	ed By.	Sheet M	No.	m Per	A.P.		
Quantum	า	Tel: 01554 74488 Fax:	30)quantumgeotech.co.u	k		ator: G		arby	1 Of	10.	Page 10	metres	irements in s unless se stated	AGS

Con	tra	ct :	LI	ant	arn	am 3	G Pito	ch, Cv	vmbra	an								-	nic Probe
Clie	nt :	T	orfa	aen	Co	ounty	Boro	ugh C	Counc	il								D	P10
Dates									ob Nun			69				d Level :	Le		O.D. ance Datum
Loca	tion	: V	Vith	in p	layir	ng field	1	E	Enginee	er: C	Capita				Coordi	nates:	1933	91.76 E 81.11 N dinates to Na	tional Grid
Depth (m)	(Blow	eadir s / 10 3)Ōmn			5 ,		OW CC		(N100	VALL 30		40	45	Torque (Nm)		Rema	
_	2	2	8	4	5		 	 			+	+	+		+				
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– Equip	ment	: Dai	ndo T	Terrie	er Rig]					C	ommen	ts:						
							1990):Par	t 9, Sect.3	.2										
	Plas Newydd SA4 0FQ Op								Operator QG		gged By. P Darby		eet No. Of 1	m Per Page 10	metre	urements in s unless ise stated	AGS		

Con	tra	ct :	LI	ant	arn	am 3	G Pite	ch, Cv	vmb	ran									-	nic Probe
Clie	nt :	Т	orfa	aen	Co	ounty	Boro	ugh (Coun	cil									D	P11
Dates												20269)				l Level :	Le		O.D. ance Datum
Loca	tion	: V	Vith	in p	layir	ng field	1]	Engin	eer :	Cap	oita				Coordi	nates:	1933	74.87 E 52.17 N linates to Na	tional Grid
Depth (m)	(Blow	_)Ōmn			5 -		.OW		NT (N 25	100 V	/ALUE) 4	15	Torque (Nm)		Rema	ırks
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Equip	ment	: Dai	ndo T	Terrie	er Rig	9		:	:	:		Con	nments	:						
Test ca	rried o	ut in a	ccord	lance	with B			t 9, Sect.3	.2				-		-		m D-			
Plas Newydd SA4 0FQ Tel: 01554 74 Fax: email: enquiri						744880	mgeotech.co.u	ık			erator: QG		<mark>ged By</mark> . Darby		t No. Of 1	m Per Page 10	All meas metre otherw	urements in s unless se stated	ACS	

Contract: Llantarnam 3G Pitch,	Cwmbran					Dynamic Probe
Client: Torfaen County Borough	Council					DP12
Dates : 9/6/20 - 9/6/20	Job Numbe)		L	8.31 m A.O.D. evel to Ordnance Datum
Location : Within playing field	Engineer :	Capita		Coordir	193	205.34 E 361.13 N rdinates to National Grid
Depth (m) 1 2 3 4 5 5 10	BLOW COUN 15 20	NT (N100 V	ALUES) 35 40	45	Torque (Nm)	Remarks
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- 7.5						
9.0						
9.5						
Equipment: Dando Terrier Rig	<u> </u>	Com	iments:	!		
Test carried out in accordance with BS 1377 (1990):Part 9, Se Plas Newydd SA4 0FQ Tel: 01554 744800 Fax: email: enquiries@quantumgeotech		Operator: QG	Logged By. P Darby	Sheet No. 1 Of 1	m Per Page All mea metr othen	surements in es unless wise stated

Contract : Llar	ntarnam 3G Pitch,	Cwmbran					Dynamic Probe
Client : Torfae	en County Boroug	n Council					DP13
Dates : 9/6/20 - 9/		Job Number				L	B.24 m A.O.D. evel to Ordnance Datum
Location : Within	playing field	Engineer : C	Capita		Coordin	1933	222.88 E 348.21 N rdinates to National Grid
Depth (m) Reading (Blows / 100m) 1 2 3 4	5 10	BLOW COUNT 15 20	F (N100 V	ALUES) 35 40	45	Torque (Nm)	Remarks
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- 9.5							
Equipment: Dando Ter			Com	ments:	_		
	ce with BS 1377 (1990):Part 9, S Plas Newydd SA4 0FQ Tel: 01554 744880 Fax:		Operator: QG	Logged By. P Darby	Sheet No. 1 Of 1	Page metr	surements in es unless vise stated
	email: enquiries@quantumgeoted	h.co.uk				10	

Con	tra	ct :	LI	ant	arn	am 30	G Pito	ch, Cv	vmbra	an										nic Probe
Clie	nt :	T	orfa	aen	Со	unty	Boro	ugh C	counc	il										P14
Dates									ob Nur)				Level :	Le		O.D. ance Datum
Loca	tion	: V	Vith	in pl	layir	ng field		E	Enginee	er :	Сар	oita				Coordin	nates:	1933	91.83 E 58.81 N linates to Na	utional Grid
Depth	(R Blows	eadir s / 10	ng I0mm	ו)			BL	OW C	OUN	IT (N	100 \	ALUE	S)			Torque		Rema	
(m)	1 2	2	3	4	5	ę	5 1	0 1	5 2	0	25	30	3	5 40) .	45	(Nm) 3			
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										erator: QG		ged By. Darby		et No. Of 1	m Per Page 10	metre	urements in s unless ise stated	AGS		

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Equipment: Dando Terrier Rig Comments: Test carried out in accordance with BS 1377 (1990):Part 9, Sect.3.2 Plas Newydd Plas Newydd Staff Operator: Logged By. Sheet No. m Per All measurements in Test Carried By.	- 9.0																			
Equipment: Dando Terrier Rig Comments: Test carried out in accordance with BS 1377 (1990):Part 9, Sect.3.2 Plas Newydd Plas Newydd Staff Operator: Logged By. Sheet No. m Per All measurements in Test Carried By.																				
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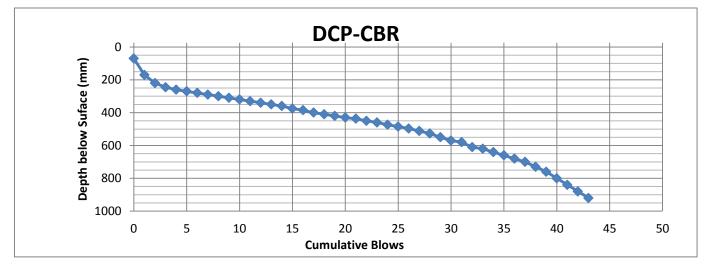


APPENDIX V – TRL PROBE RESULTS



Determination of Equivalent CBR using TRL Dynamic Cone Penetrometer DCP CBR Relationship based on Kleyn & Van Heerden (60° Cone) - TRL, DMRB HD 29/08 & TP 12

Client Name:	Torfaen Co	unty Borou	gh Council							
Client Address:	Civic Centre, Pontypool, NP4 6YB.									
Contract Name:	Llantarnam	antarnam Sports Pitch, Cwmbran. Contract No.: Q0269								
Site Reference:	-	1	Lab. Refere	ence:	1.1	Date Tested:	12.6.20			
Sample Location:			HP01			Date Received:	12.6.20			
Material Description:					Topso	il				
Supplier:		In-Situ Source: In-Situ								
Depth Start of Test (m	m)	0r	nm	Tested By:		TMB + PD				



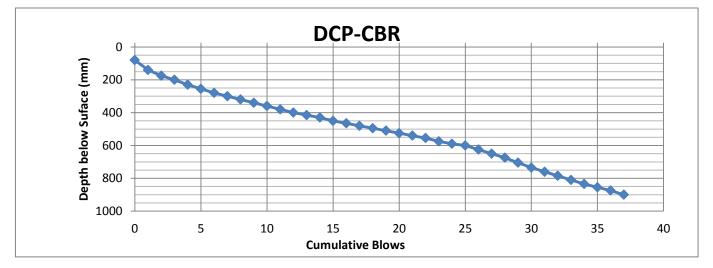
CBR Relationship	TRL Equation Log ₁₀ (CBR) = 2.48-1.057*Log ₁₀ (Peneration Rate)
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	Number	of Blows	Penetrat	ion (mm)	Rate of Penetration	Equilavent	
Layer No.	Start	Finish	Start	Finish	(mm/blow)	CBR (%)	Remarks
1	0	36	70	700	17.50	15	
2	36	43	700	920	31.43	8	



Determination of Equivalent CBR using TRL Dynamic Cone Penetrometer DCP CBR Relationship based on Kleyn & Van Heerden (60° Cone) - TRL, DMRB HD 29/08 & TP 12

Client Name:	Torfaen Co	unty Borou	gh Council							
Client Address:	Civic Centre, Pontypool, NP4 6YB.									
Contract Name:	Llantarnam	antarnam Sports Pitch, Cwmbran. Contract No.: Q0269								
Site Reference:		2	Lab. Refere	ence:	1.2	Date Tested:	12.6.20			
Sample Location:			HP02			Date Received:	12.6.20			
Material Description:					Topso	il				
Supplier:		In-Situ Source: In-Situ								
Depth Start of Test (m	m)	0r	nm	Tested By:		TMB + PD				



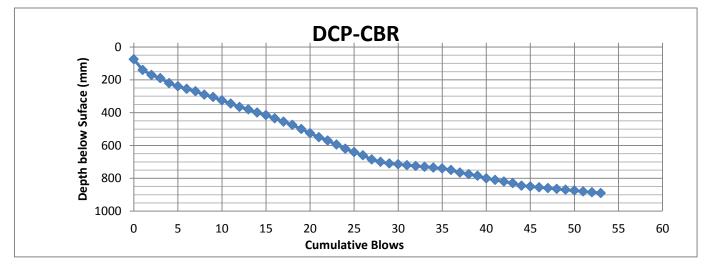
CBR Relationship - TRL Equation Log_{10} (CBR) = 2.48-1.057* Log_{10} (Peneration Rate)

	Number	of Blows	Penetrat	ion (mm)	Rate of Penetration	Equilavent	
Layer No.	Start	Finish	Start	Finish	(mm/blow)	CBR (%)	Remarks
1	0	24	80	600	21.67	12	
2	24	36	600	900	25.00	10	



Determination of Equivalent CBR using TRL Dynamic Cone Penetrometer DCP CBR Relationship based on Kleyn & Van Heerden (60° Cone) - TRL, DMRB HD 29/08 & TP 12

Client Name:	Torfaen Co	unty Borou	gh Council						
Client Address:	Civic Centre, Pontypool, NP4 6YB.								
Contract Name:	Llantarnam	ntarnam Sports Pitch, Cwmbran. Contract No.: Q0269							
Site Reference:	3	3	Lab. Refere	ence:	1.3	Date Tested:	12.6.20		
Sample Location:			HP03			Date Received:	12.6.20		
Material Description:					Topso	il			
Supplier:		In-Situ Source: In-Situ							
Depth Start of Test (m	m)	0r	nm	Tested By:		TMB + PD			



CBR Relationship - TRL Equation Log_{10} (CBR) = 2.48-1.057* Log_{10} (Peneration Rate)

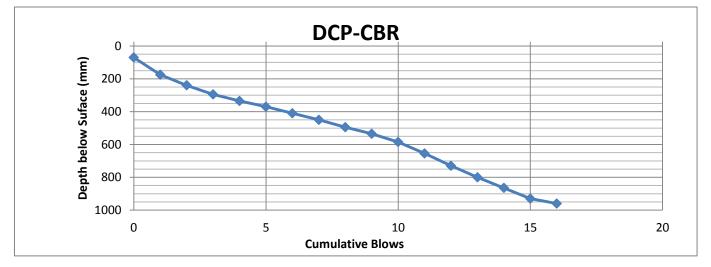
	Number	of Blows	Penetrat	ion (mm)	Rate of Penetration	Equilavent	
Layer No.	Start	Finish	Start	Finish	(mm/blow)	CBR (%)	Remarks
1	0	27	75	685	22.59	11	
2	27	36	685	750	7.22	37	
3	36	45	750	850	11.11	24	
4	45	53	850	890	5.00	55	

Signed: T.M. Burke Position: Principal Engineering Technician Dated: 17 June 2020



Determination of Equivalent CBR using TRL Dynamic Cone Penetrometer DCP CBR Relationship based on Kleyn & Van Heerden (60° Cone) - TRL, DMRB HD 29/08 & TP 12

Client Name:	Torfaen Co	unty Borou	gh Council							
Client Address:	Civic Centre, Pontypool, NP4 6YB.									
Contract Name:	Llantarnam	lantarnam Sports Pitch, Cwmbran. Contract No.: Q0269								
Site Reference:	4	4	Lab. Refere	ence:	1.4	Date Tested:	12.6.20			
Sample Location:			HP04			Date Received:	12.6.20			
Material Description:					Topso	pil				
Supplier:		In-Situ Source: In-Situ								
Depth Start of Test (m	m)	0r	nm	Tested By:		TMB + PD				



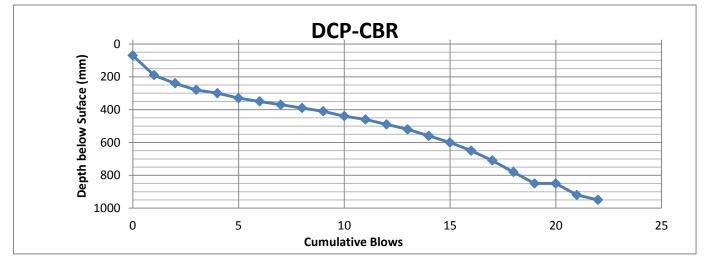
CBR Relationship - TRL Equation Log_{10} (CBR) = 2.48-1.057* Log_{10} (Peneration Rate)

	Number	of Blows	Penetrat	ion (mm)	Rate of Penetration	Equilavent	
Layer No.	Start	Finish	Start	Finish	(mm/blow)	CBR (%)	Remarks
1	0	9	70	535	51.67	5	
2	9	16	535	960	60.71	4	



Determination of Equivalent CBR using TRL Dynamic Cone Penetrometer DCP CBR Relationship based on Kleyn & Van Heerden (60° Cone) - TRL, DMRB HD 29/08 & TP 12

Client Name:	Torfaen Co	unty Borou	gh Council							
Client Address:	Civic Centre, Pontypool, NP4 6YB.									
Contract Name:	Llantarnam	lantarnam Sports Pitch, Cwmbran. Contract No.: Q0269								
Site Reference:	Į,	5	Lab. Refere	ence:	1.5	Date Tested:	12.6.20			
Sample Location:			HP05			Date Received:	12.6.20			
Material Description:					Topso	il				
Supplier:		In-Situ Source: In-Situ								
Depth Start of Test (m	m)	0r	nm	Tested By:		TMB + PD				



CBR Relationship - TRL Equation Log_{10} (CBR) = 2.48-1.057* Log_{10} (Peneration Rate)

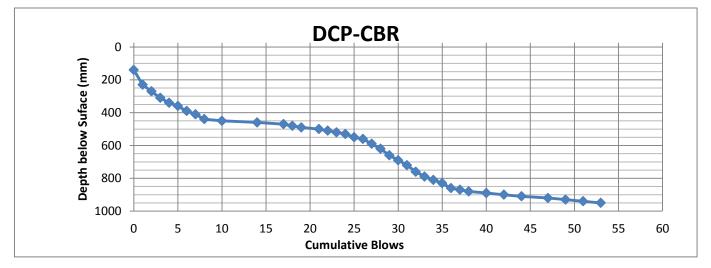
	Number	of Blows	Penetrat	ion (mm)	Rate of Penetration	Equilavent	Describe
Layer No.	Start	Finish	Start	Finish	(mm/blow)	CBR (%)	Remarks
1	0	5	70	330	52.00	5	
2	5	13	330	520	23.75	11	
3	13	19	520	850	55.00	4	
4	19	22	850	950	33.33	7	

Signed: *T.M. Burke*



Determination of Equivalent CBR using TRL Dynamic Cone Penetrometer DCP CBR Relationship based on Kleyn & Van Heerden (60° Cone) - TRL, DMRB HD 29/08 & TP 12

Client Name:	Torfaen Co	unty Borough Co	ouncil							
Client Address:	Civic Centre, Pontypool, NP4 6YB.									
Contract Name:	Llantarnam	antarnam Sports Pitch, Cwmbran. Contract No.: Q0269								
Site Reference:		6 Lab.	Refere	ence:	1.6	Date Tested:	12.6.20			
Sample Location:		H	P07			Date Received:	12.6.20			
Material Description:					Tops	oil				
Supplier:		In-Situ Source: In-Situ								
Depth Start of Test (m	m)	0mm		Tested By:		TMB +	PD			



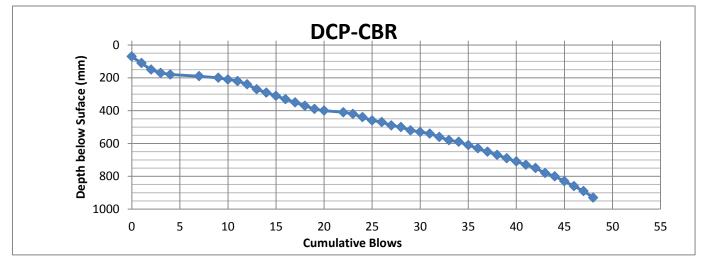
	Number	of Blows	Penetrat	ion (mm)	Rate of Penetration	Equilavent	
Layer No.	Start	Finish	Start	Finish	(mm/blow)	CBR (%)	Remarks
1	0	8	140	440	37.50	7	
2	8	23	440	520	5.33	51	
3	23	36	520	860	26.15	10	
4	36	53	860	950	5.29	52	

Signed: T.M. Burke



Determination of Equivalent CBR using TRL Dynamic Cone Penetrometer DCP CBR Relationship based on Kleyn & Van Heerden (60° Cone) - TRL, DMRB HD 29/08 & TP 12

Client Name:	Torfaen Co	Torfaen County Borough Council							
Client Address:	Civic Centre	Civic Centre, Pontypool, NP4 6YB.							
Contract Name:	Llantarnam	Llantarnam Sports Pitch, Cwmbran.				Contract No.:	Q0269		
Site Reference:		7		ence:	1.7	Date Tested:	12.6.20		
Sample Location:		HP08				Date Received:	12.6.20		
Material Description:		Topsoil							
Supplier:		In-Situ Source:				In-Situ			
Depth Start of Test (m	Start of Test (mm)		0mm T			TMB + PD			



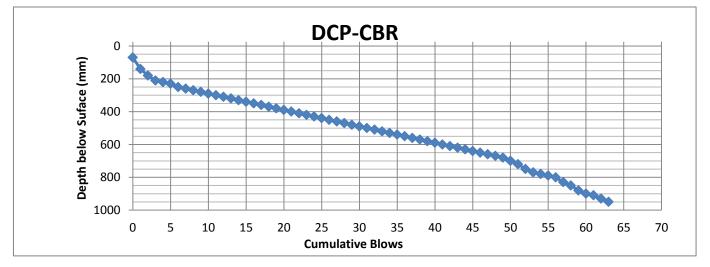
	Number	of Blows	Penetrat	ion (mm)	Rate of Penetration	Equilavent	
Layer No.	Start	Finish	Start	Finish	(mm/blow)	CBR (%)	Remarks
1	0	3	70	170	33.33	7	
2	3	10	170	210	5.71	48	
3	10	20	210	400	19.00	13	
4	20	39	400	690	15.26	17	
5	39	48	690	930	26.67	9	

Signed: T.M. Burke Position: Principal Engineering Technician Dated: 17 June 2020



Determination of Equivalent CBR using TRL Dynamic Cone Penetrometer DCP CBR Relationship based on Kleyn & Van Heerden (60° Cone) - TRL, DMRB HD 29/08 & TP 12

Client Name:	Torfaen Co	Torfaen County Borough Council							
Client Address:	Civic Centre	Civic Centre, Pontypool, NP4 6YB.							
Contract Name:	Llantarnam Sports Pitch, Cwmbran.					Contract No.:	Q0269		
Site Reference:	8 L		Lab. Refere	ence:	1.8	Date Tested:	12.6.20		
Sample Location:		НРО9				Date Received:	12.6.20		
Material Description:		Topsoil							
Supplier:		In-Situ Source:				In-Situ			
Depth Start of Test (mm)		0mm Tes		Tested By:		TMB + PD			



CBR Relationship - TRL Equation Log_{10} (CBR) = 2.4	48-1.057*Log ₁₀ (Peneration Rate)

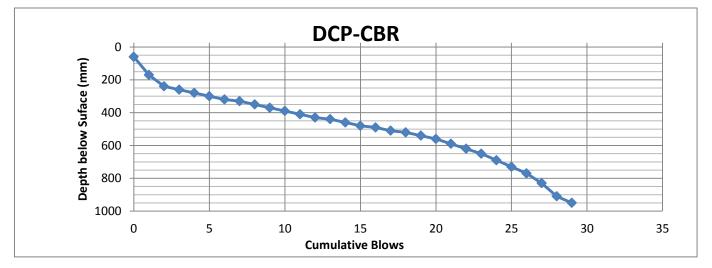
	Number	of Blows	Penetrat	ion (mm)	Rate of Penetration	Equilavent	
Layer No.	Start	Finish	Start	Finish	(mm/blow)	CBR (%)	Remarks
1	0	4	70	220	37.50	7	
2	4	27	220	430	9.13	29	
3	27	47	430	520	4.50	62	
4	47	64	520	670	8.82	30	
5	64	71	670	790	17.14	15	
6	71	79	790	950	20.00	13	

Signed: T.M. Burke



Determination of Equivalent CBR using TRL Dynamic Cone Penetrometer DCP CBR Relationship based on Kleyn & Van Heerden (60° Cone) - TRL, DMRB HD 29/08 & TP 12

Client Name:	Torfaen Co	Torfaen County Borough Council							
Client Address:	Civic Centre	Civic Centre, Pontypool, NP4 6YB.							
Contract Name:	Llantarnam Sports Pitch, Cwmbran.					Contract No.:	Q0269		
Site Reference:	9	9		Lab. Reference:		Date Tested:	12.6.20		
Sample Location:		HP10				Date Received:	12.6.20		
Material Description:		Topsoil							
Supplier:		In-Situ		Source:		In-Situ			
Depth Start of Test (m	t of Test (mm)		0mm Tested By:			TMB + PD			



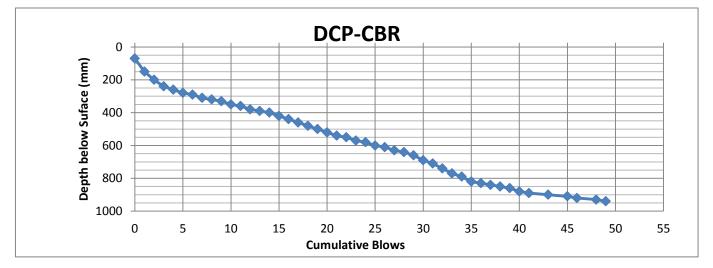
CBR Relationship - TRL Equation Log_{10} (CBR) = 2.48-1.057* Log_{10} (Peneration Rate)

	Number	of Blows	Penetrat	ion (mm)	Rate of Penetration	Equilavent	
Layer No.	Start	Finish	Start	Finish	(mm/blow)	CBR (%)	Remarks
1	0	3	70	260	63.33	4	
2	3	23	260	650	19.50	13	
3	23	29	650	950	50.00	5	



Determination of Equivalent CBR using TRL Dynamic Cone Penetrometer DCP CBR Relationship based on Kleyn & Van Heerden (60° Cone) - TRL, DMRB HD 29/08 & TP 12

Client Name:	Torfaen Co	Torfaen County Borough Council							
Client Address:	Civic Centre	Civic Centre, Pontypool, NP4 6YB.							
Contract Name:	Llantarnam Sports Pitch, Cwmbran.					Contract No.:	Q0269		
Site Reference:	10 Lab.		Lab. Refere	ence:	1.10	Date Tested:	12.6.20		
Sample Location:		HP12			Date Received:	12.6.20			
Material Description:		Topsoil							
Supplier:		In-Situ	Source: In-Situ						
Depth Start of Test (m	Start of Test (mm)		0mm			TMB + PD			



CBR Relationship -	TRL Equation Log_{10} (CBR) = 2.48-1.057* Log_{10} (Peneration I	Rate)
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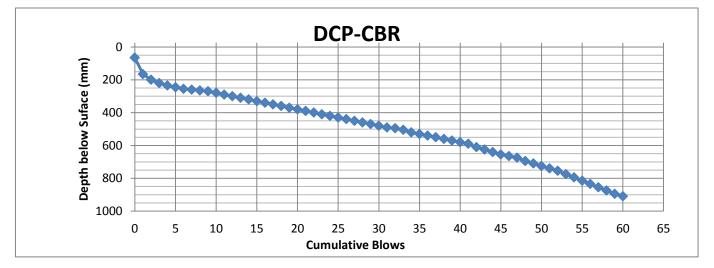
	Number	of Blows	Penetrat	ion (mm)	Rate of Penetration	Equilavent	
Layer No.	Start	Finish	Start	Finish	(mm/blow)	CBR (%)	Remarks
1	0	4	70	260	47.50	5	
2	4	29	260	660	16.00	16	
3	29	35	660	820	26.67	9	
4	35	49	820	940	8.57	31	

Signed: *T.M. Burke*



Determination of Equivalent CBR using TRL Dynamic Cone Penetrometer DCP CBR Relationship based on Kleyn & Van Heerden (60° Cone) - TRL, DMRB HD 29/08 & TP 12

Client Name:	Torfaen County Borough Council								
Client Address:	Civic Centre, Pontypool, NP4 6YB.								
Contract Name:	Llantarnam Sports Pitch, Cwmbran. Contract No.: Q0269								
Site Reference:	1	.1	Lab. Refere	ence:	1.11	Date Tested:	12.6.20		
Sample Location:			HP13			Date Received:	12.6.20		
Material Description:					Topso	il			
Supplier:		In-Situ Source:				In-Situ			
Depth Start of Test (m	Or	nm	Tested By: TMB + PD						



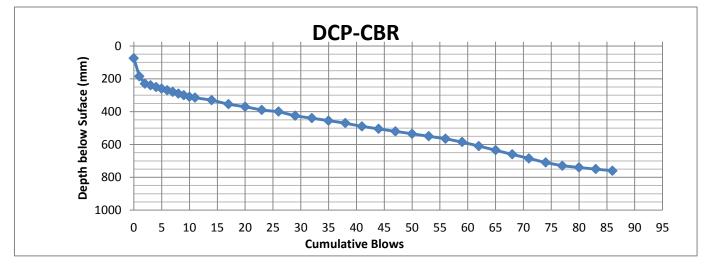
	Number	of Blows	Penetrat	ion (mm)	Rate of Penetration	Equilavent	
Layer No.	Start	Finish	Start	Finish	(mm/blow)	CBR (%)	Remarks
1	0	3	65	220	51.67	5	
2	3	10	220	280	8.57	31	
3	10	40	280	580	10.00	26	
4	40	60	580	910	16.50	16	

Signed: T.M. Burke



Determination of Equivalent CBR using TRL Dynamic Cone Penetrometer DCP CBR Relationship based on Kleyn & Van Heerden (60° Cone) - TRL, DMRB HD 29/08 & TP 12

Client Name:	Torfaen County Borough Council								
Client Address:	Civic Centre, Pontypool, NP4 6YB.								
Contract Name:	Llantarnam	Llantarnam Sports Pitch, Cwmbran. Contract No.: Q0269							
Site Reference:	1	.2	Lab. Refere	ence:	1.12	Date Tested:	12.6.20		
Sample Location:			HP14			Date Received:	12.6.20		
Material Description:					Topso	bil			
Supplier:		In-Situ Source:			In-Situ				
Depth Start of Test (m	0r	nm	Tested By: TMB + PD		D				



CBR Relationship - TRL Equation Log_{10} (CBR) = 2.4	48-1.057*Log ₁₀ (Peneration Rate)

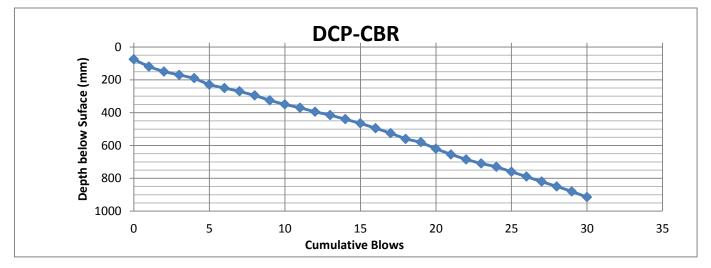
	Number	of Blows	Penetration (mm)		Rate of Penetration	Equilavent	
Layer No.	Start	Finish	Start	Finish	(mm/blow)	CBR (%)	Remarks
1	0	2	75	230	77.50	3	
2	2	10	230	310	10.00	26	
3	10	59	310	585	5.61	49	
4	59	77	585	730	8.06	33	
5	77	86	730	760	3.33	85	

Signed: T.M. Burke



Determination of Equivalent CBR using TRL Dynamic Cone Penetrometer DCP CBR Relationship based on Kleyn & Van Heerden (60° Cone) - TRL, DMRB HD 29/08 & TP 12

Client Name:	Torfaen County Borough Council								
Client Address:	Civic Centre, Pontypool, NP4 6YB.								
Contract Name:	Llantarnam	Llantarnam Sports Pitch, Cwmbran. Contract No.: Q0269							
Site Reference:	1	.3	Lab. Refere	ence:	1.13	Date Tested:	12.6.20		
Sample Location:			HP15			Date Received:	12.6.20		
Material Description:					Topso	il			
Supplier:		In-Situ Source:			In-Situ				
Depth Start of Test (m	Or	nm	Tested By: TMB + PD						



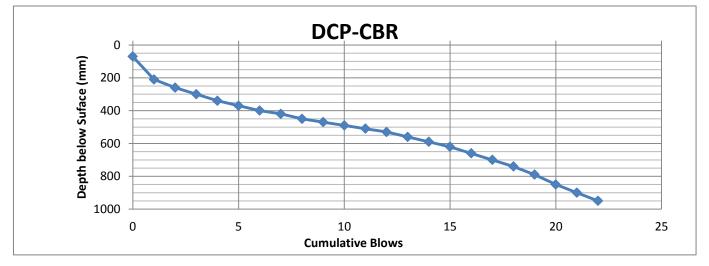
CBR Relationship - TRL Equation Log_{10} (CBR) = 2.48-1.057* Log_{10} (Peneration Rate)

	Number	of Blows	Penetrat	ion (mm)	Rate of Penetration	Equilavent	
Layer No.	Start	Finish	Start	Finish	(mm/blow)	CBR (%)	Remarks
1	0	16	75	495	26.25	10	
2	16	30	495	915	30.00	8	



Determination of Equivalent CBR using TRL Dynamic Cone Penetrometer DCP CBR Relationship based on Kleyn & Van Heerden (60° Cone) - TRL, DMRB HD 29/08 & TP 12

Client Name:	Torfaen County Borough Council								
Client Address:	Civic Centre, Pontypool, NP4 6YB.								
Contract Name:	Llantarnam Sports Pitch, Cwmbran. Contract No.: Q0269								
Site Reference:	1	.4	Lab. Refere	ence:	1.14	Date Tested:	12.6.20		
Sample Location:			HP16			Date Received:	12.6.20		
Material Description:					Topso	il			
Supplier:		In-Situ Source:			In-Situ				
Depth Start of Test (m	Or	nm	Tested By: TMB + PD						



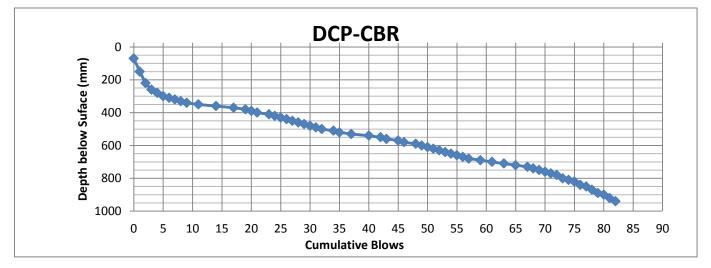
CBR Relationship - TRL Equation Log_{10} (CBR) = 2.48-1.057* Log_{10} (Peneration Rate)

	Number	of Blows	Penetrat	ion (mm)	Rate of Penetration	Equilavent	
Layer No.	Start	Finish	Start	Finish	(mm/blow)	CBR (%)	Remarks
1	0	3	70	300	76.67	3	
2	3	15	300	620	26.67	9	
3	15	22	620	950	47.14	5	



Determination of Equivalent CBR using TRL Dynamic Cone Penetrometer DCP CBR Relationship based on Kleyn & Van Heerden (60° Cone) - TRL, DMRB HD 29/08 & TP 12

Client Name:	Torfaen County Borough Council								
Client Address:	Civic Centre, Pontypool, NP4 6YB.								
Contract Name:	Llantarnam	Llantarnam Sports Pitch, Cwmbran. Contract No.: Q0269							
Site Reference:	1	.5	Lab. Refere	ence:	1.15	Date Tested:	12.6.20		
Sample Location:			HP17			Date Received:	12.6.20		
Material Description:					Topso	bil			
Supplier:		In-Situ Source:			In-Situ				
Depth Start of Test (m	Or	nm	Tested By: TMB + PD		D				



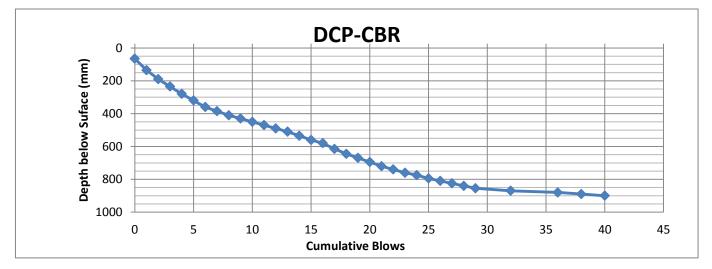
	Number	of Blows	Penetrat	ion (mm)	Rate of Penetration	Equilavent	
Layer No.	Start	Finish	Start	Finish	(mm/blow)	CBR (%)	Remarks
1	0	3	70	260	63.33	4	
2	3	9	260	340	13.33	20	
3	9	23	340	410	5.00	55	
4	23	31	410	490	10.00	26	
5	31	48	490	590	5.88	46	
6	48	57	590	680	10.00	26	
7	57	67	680	730	5.00	55	
8	67	75	730	820	11.25	23	
9	75	82	820	940	17.14	15	

Signed: T.M. Burke



Determination of Equivalent CBR using TRL Dynamic Cone Penetrometer DCP CBR Relationship based on Kleyn & Van Heerden (60° Cone) - TRL, DMRB HD 29/08 & TP 12

Client Name:	Torfaen County Borough Council								
Client Address:	Civic Centre, Pontypool, NP4 6YB.								
Contract Name:	Llantarnam	n Sports Pito	ch, Cwmbra	n.		Contract No.:	Q0269		
Site Reference:	1	.6	Lab. Refere	ence:	1.16	Date Tested:	12.6.20		
Sample Location:			HP18			Date Received:	12.6.20		
Material Description:					Topso	bil			
Supplier:		In-Situ Source: In-Situ							
Depth Start of Test (m	nm) Omm Tested By: TMB + PD								



CBR Relationship - TRL Equation Log_{10} (CBR) = 2.48-1.057* Log_{10} (Peneration Rate)

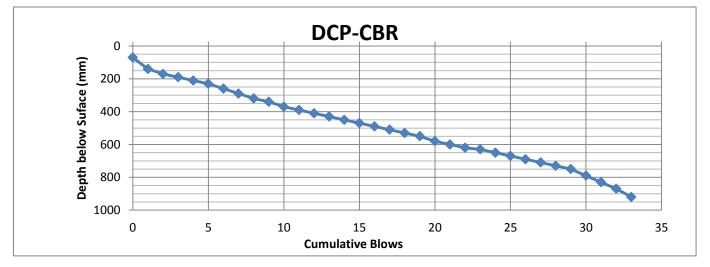
	Number	of Blows	Penetrat	ion (mm)	Rate of Penetration	Equilavent	
Layer No.	Start	Finish	Start	Finish	(mm/blow)	CBR (%)	Remarks
1	0	6	65	360	49.17	5	
2	6	16	360	580	22.00	12	
3	16	23	580	760	25.71	10	
4	23	29	760	855	15.83	16	
5	29	40	855	900	4.09	68	

Signed: T.M. Burke



Determination of Equivalent CBR using TRL Dynamic Cone Penetrometer DCP CBR Relationship based on Kleyn & Van Heerden (60° Cone) - TRL, DMRB HD 29/08 & TP 12

Client Name:	Torfaen County Borough Council								
Client Address:	Civic Centre	e, Pontypod	ol, NP4 6YB.						
Contract Name:	Llantarnam	Sports Pite	ch, Cwmbra	n.		Contract No.:	Q0269		
Site Reference:	1	7	Lab. Refere	ence:	1.17	Date Tested:	12.6.20		
Sample Location:			HP20			Date Received:	12.6.20		
Material Description:		Торѕоі							
Supplier:		In-Situ Source: In-Situ							
Depth Start of Test (m	m)	Or	nm	Tested By:		TMB + PD			



CBR Relationship - TRL Equation Log_{10} (CBR) = 2.48-1.057* Log_{10} (Peneration Rate)

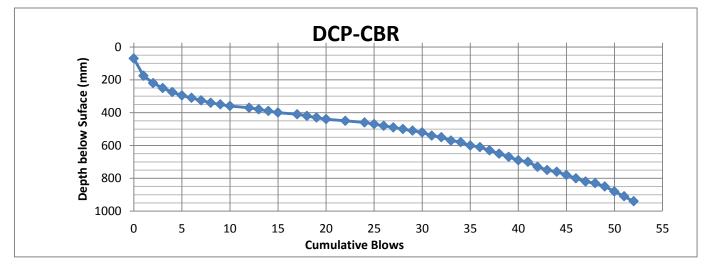
	Number	of Blows	Penetrat	ion (mm)	Rate of Penetration	Equilavent	
Layer No.	Start	Finish	Start	Finish	(mm/blow)	CBR (%)	Remarks
1	0	2	70	170	50.00	5	
2	2	22	170	620	22.50	11	
3	22	29	620	750	18.57	14	
4	29	33	750	920	42.50	6	

Signed: T.M. Burke Position: Principal Engineering Technician Dated: 17 June 2020



Determination of Equivalent CBR using TRL Dynamic Cone Penetrometer DCP CBR Relationship based on Kleyn & Van Heerden (60° Cone) - TRL, DMRB HD 29/08 & TP 12

Client Name:	Torfaen County Borough Council									
Client Address:	Civic Centre	Civic Centre, Pontypool, NP4 6YB.								
Contract Name:	Llantarnam	Sports Pito	ch, Cwmbra	n.		Contract No.:	Q0269			
Site Reference:	1	.8	Lab. Refere	ence:	1.18	Date Tested:	12.6.20			
Sample Location:			TP19			Date Received:	12.6.20			
Material Description:	Topsoil									
Supplier:	In-Situ Source: In-Situ									
Depth Start of Test (m	m)	0r	nm	Tested By:		TMB + PD				



CBR Relationship -	TRL Equation Log ₁₀ (CBR) = 2.48-1.057*Log ₁₀ (Peneration	Rate)
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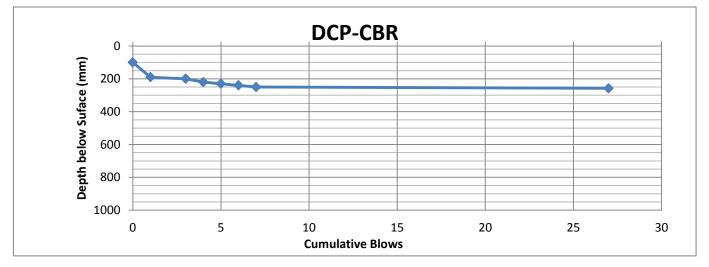
	Number	of Blows	Penetrat	ion (mm)	Rate of Penetration	Equilavent	
Layer No.	Start	Finish	Start	Finish	(mm/blow)	CBR (%)	Remarks
1	0	3	70	250	60.00	4	
2	3	10	250	360	15.71	16	
3	10	24	360	460	7.14	38	
4	24	35	460	600	12.73	21	
5	35	47	600	820	18.33	14	
6	47	52	820	940	24.00	10	

Signed: T.M. Burke



Determination of Equivalent CBR using TRL Dynamic Cone Penetrometer DCP CBR Relationship based on Kleyn & Van Heerden (60° Cone) - TRL, DMRB HD 29/08 & TP 12

Client Name:	Torfaen County Borough Council								
Client Address:	Civic Centre	e, Pontypod	ol, NP4 6YB.						
Contract Name:	Llantarnam	n Sports Pito	ch, Cwmbra	n.		Contract No.:	Q0269		
Site Reference:	1	.9	Lab. Refere	ence:	1.19	Date Tested:	12.6.20		
Sample Location:			TP20			Date Received:	12.6.20		
Material Description:		Topsoil							
Supplier:		In-Situ Source: In-Situ							
Depth Start of Test (m	m)	0r	nm	Tested By:		TMB + PD			



CBR Relationship - TRL Equation Log_{10} (CBR) = 2.48-1.057* Log_{10} (Peneration Rate)

	Number	of Blows	Penetrat	ion (mm)	Rate of Penetration	Equilavent	
Layer No.	Start	Finish	Start	Finish	(mm/blow)	CBR (%)	Remarks
1	0	1	100	190	90.00	3	
2	1	27	190	258	2.62	109	



APPENDIX VI – SOAKAWAY TEST RESULTS

Contract: Llantarnam 3G Pitch, Cwmbran

Client : Torfaen County Borough Council

n

Job Number : Q0269

Time

(Minutes)

0.0

1.0

2.0

3.0

Depth of water from ground level (m)

200

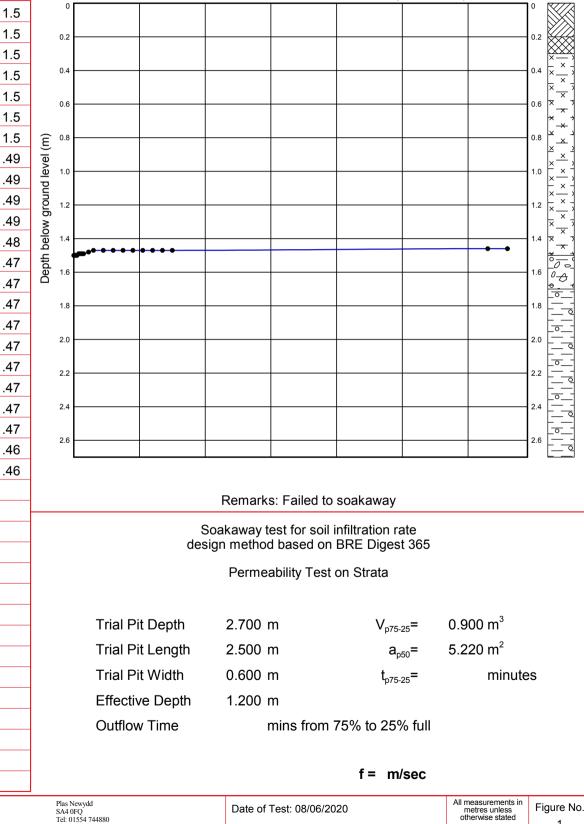
SOAKAWAY TEST CALCULATION SHEET

400

Field Observations from soakaway trial pit

600

4.0 1.5 1.5 5.0 10.0 1.5 0.8 level (m) 15.0 1.49 1.0 1.49 20.0 Depth below ground 25.0 1.49 1.2 1.49 30.0 1.4 45.0 1.48 60.0 1.47 1.6 90.0 1.47 120.0 1.47 1.8 150.0 1.47 2.0 180.0 1.47 210.0 1.47 2.2 240.0 1.47 270.0 1.47 2.4 300.0 1.47 2.6 1260.0 1.46 1320.0 1.46 Plas Newydd SA4 0FQ Tel: 01554 744880 Quantum Tel nail: enquiries@quantumgeotech.co.uk Library File: C:\USERS\PUBLIC\DOCUMENTS\BENTLEY\GINT\LIBRARIES\QUANTUM 4.GLB. Form Name: SOAKAWAY. Version 1.01.000, 13/02/09



Date of Test: 08/06/2020

Project File: Q0269.GPJ

1

Time (minutes) 800 1,000 1.200

Engineer : Capita

Contract: Llantarnam 3G Pitch, Cwmbran

Point Plotted TP20.1

All measurements in metres unless otherwise stated

Figure No.

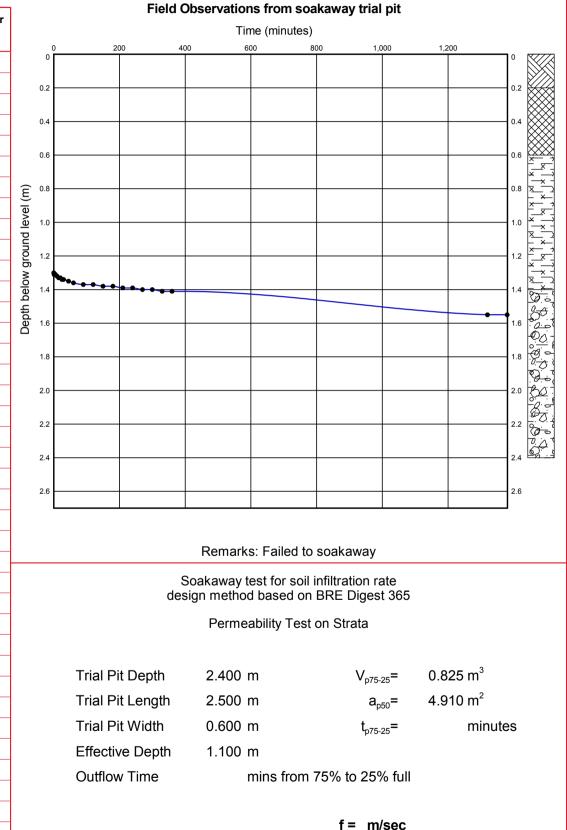
2

Client : Torfaen County Borough Council

Job Number : Q0269 Engineer : Capita

SOAKAWAY TEST CALCULATION SHEET

Depth of water from ground level (m) Time (Minutes) n 200 400 600 0 0.0 1.3 1.31 1.0 02 2.0 1.31 0.4 1.31 3.0 4.0 1.31 0.6 1.31 5.0 10.0 1.32 0.8 level (m) 15.0 1.33 1.0 1.33 20.0 Depth below ground 25.0 1.34 1.2 1.34 30.0 1.4 45.0 1.35 60.0 1.36 1.6 90.0 1.37 120.0 1.37 1.8 150.0 1.38 2.0 180.0 1.38 210.0 1.39 2.2 240.0 1.39 270.0 1.4 2.4 300.0 1.4 2.6 330.0 1.41 360.0 1.41 1320.0 1.55 1380.0 1.55 **Trial Pit Depth** 2.400 m **Trial Pit Length** 2.500 m Trial Pit Width 0.600 m Effective Depth 1.100 m **Outflow Time** Plas Newydd Date of Test: 08/06/2020 SA4 0FQ Tel: 01554 744880 Quantum Tel Project File: Q0269.GPJ nail: enquiries@quantumgeotech.co.uk



Library File: C:\USERS\PUBLIC\DOCUMENTS\BENTLEY\GINT\LIBRARIES\QUANTUM 4.GLB. Form Name: SOAKAWAY. Version 1.01.000, 13/02/09



APPENDIX VII- MONITORING RECORDS

Project Name:	Llantarnam Sports Pitch
Project No.:	Q0269
BH/TP No.:	WS01
Instruments Used:	Water Dip Meter Probe, GA2000 Gas Anaylser

	Installatior	Date:		
GL (mAOD)	Pipe	Туре	Installation Depth (mbgl)	Response Zone (mbgl)
39.869	A	50mm	2.50	0.5-2.5
53.009				

Quantum

Page 1 of 1

Pipe	Date	Time (24hrs)	Atmos Pressure	Differential Well Pressure	Flow	CH4	CO ₂	O ₂	со	H ₂ S	Water	Level	Holel	Depth	Local V	Veather	Remarks
			mBar	mBar	L/hr	%	%	%	ppm	ppm	mbgl	mAOD	mbgl	mAOD	Recent	Current	
А	08/06/2020	8.15									1.40	38.47	2.42	37.45	Cloudy	Sunny	
А	08/06/2020	8.15									1.40	-1.40	2.42	37.45	Cloudy	Sunny	
А	15/06/2020	09:30	1006	0.53	0.0	0.0	3.0	18.4	0	0	1.38	38.49	2.42	37.45	Sunny	Sunny	Water Sample Taken - EW1
-																	
-																	
-																	
<u> </u>	•	·		<u>.</u>									<u>.</u>	<u>.</u>	<u>.</u>	·	

Project Name: Llantarnam Sports Pitch Project No.: Q0269 BH/TP No.: WS03 Instruments Used: Water Dip Meter Probe, GA2000 Gas Anaylser

I	nstallation	Date:		
GL (mAOD)	Pipe	Туре	Installation Depth (mbgl)	Response Zone (mbgl)
39,696	А	50mm	2.35	0.5-2.35
53.090				

Qu	Jantum Geotech
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Pipe	Date	Time (24hrs)	Atmos Pressure	Differential Well Pressure	Flow	CH4	CO ₂	O ₂	со	H ₂ S	Water	Water Level		HoleDepth		Veather	Remarks
			mBar	mBar	L/hr	%	%	%	ppm	ppm	mbgl	mAOD	mbgl	mAOD	Recent	Current	
А	09/06/2020	08:10									Dry		2.32	37.38	Sunny	Sunny	
А	15/06/2020	09:40	1005	0.54	0.0	0.0	3.0	19.4	0	0	2.09	37.61	2.32	37.38	Sunny	Sunny	Insufficient Water to Sample
_																	

Project Name:	Llantarnam Sports Pitch					
Project No.:	Q0269					
BH/TP No.:	WS05					
Instruments Used:	Water Dip Meter Probe, GA2000 Gas Anaylser					

	Installatior	Date:		
GL (mAOD)	Pipe	Туре	Installation Depth (mbgl)	Response Zone (mbgl)
38.817	A	50mm	1.90	0.5-1.9
30.017				

Quantum

Page 1 of 1

Pipe	Date	Time (24hrs)	Atmos Pressure	Differential Well Pressure	Flow	CH4	CO2	O ₂	со	H ₂ S	Water	Level	Hole	Depth	Local V	Veather	Remarks
			mBar	mBar	L/hr	%	%	%	ppm	ppm	mbgl	mAOD	mbgl	mAOD	Recent	Current	
А	08/06/2020	08:05									Dry		3.40	35.42	Sunny	Cloudy	
А	09/06/2020	08:05									Dry		3.40	35.42	Sunny	Sunny	
А	15/06/2020	10:00	1005	0.50	0.0	0.9	4.2	11.6	0	0	1.81	37.01	3.40	35.42	Sunny	Sunny	
<u> </u>		I		<u>I</u>		1		1		1		L	I	1	I	I	

Project Name:	Llantarnam Sports Pitch
Project No.:	Q0269
BH/TP No.:	WS09
Instruments Used:	Water Dip Meter Probe, GA2000 Gas Anaylser

	Installation	Date:		
GL (mAOD)	Pipe	Туре	Installation Depth (mbgl)	Response Zone (mbgl)
40.363	А	50mm	1.60	0.5-1.6

0	uantum Geotech
60	uantum Geotech

Page 1 of 1

Pipe	Date	Time (24hrs)	Atmos Pressure	Differential Well Pressure	Flow	CH4	CO ₂	O ₂	со	H ₂ S	Water	Level	Holel	Depth	Local V	Veather	Remarks
			mBar	mBar	L/hr	%	%	%	ppm	ppm	mbgl	mAOD	mbgl	mAOD	Recent	Current	
А	08/06/2020	08:00									Dry		1.60	38.76	Cloudy	Sunny	Well Dry
А	09/06/2020	08:00									Dry		1.60	38.76	Sunny	Sunny	Well Dry
А	15/06/2020	10:15	1005	0.49	0.1	0.0	1.5	19.3	0	0	Dry		1.60	38.76	Sunny	Sunny	



APPENDIX VIII- GEOENVIRONMENTAL LABORATORY TEST RESULTS



Chemtest

Eurofins Chemtest Ltd. Depot Road Newmarket CB8 0AL Tel: 01638 606070 Email: info@chemtest.com

Report No.:	20-15922-1		
Initial Date of Issue:	01-Jul-2020		
Client	Quantum Geotechnic Ltd		
Client Address:	Plas Newydd Llanedi Pontarddulais Swansea SA4 0FQ		
Contact(s):	Phil Darby		
Project	Q0269 Llantarnam 3G Pitch		
Quotation No.:	Q20-20396	Date Received:	24-Jun-2020
Order No.:		Date Instructed:	24-Jun-2020
No. of Samples:	3		
Turnaround (Wkdays):	5	Results Due:	30-Jun-2020
Date Approved:	01-Jul-2020		
Approved By:			
Min Mary			

Details:

Glynn Harvey, Technical Manager



2183 Final Report

Client: Quantum Geotechnic Ltd		Che	mtest J	ob No.:	20-15922	20-15922	20-15922
Quotation No.: Q20-20396	(Chemte	est Sam	ple ID.:	1021430	1021431	1021432
		Cli	ent Sam	ple ID.:	1	1	1
		Sa	ample Lo	ocation:	WS12	WS06	WS15
			Sampl	e Type:	SOIL	SOIL	SOIL
			Top De	oth (m):	1.6	0.65	1.2
	Bottom Depth (m):				2.0	1.8	1.4
	Asbestos Lab:					COVENTRY	
Determinand	Accred. SOP Units LOD						
Moisture	N	2030	%	0.020	14	12	15
Soil Colour	N	2040		N/A	Brown	Brown	Brown
Other Material	N	2040		N/A	Stones	Stones	Stones
Soil Texture	N	2040		N/A	Loam	Loam	Sand
pH (2.5:1)	N	2010		4.0	[A] 8.2	[A] 7.8	[A] 7.4
Sulphate (2:1 Water Soluble) as SO4	М	2120	g/l	0.010	0.030	0.026	0.047
Sulphate (2:1 Extract)	М	2120	mg/kg	20	60	52	94
Total Sulphur	М	2175	%	0.010	[A] < 0.010	[A] < 0.010	[A] 0.013
Sulphate (Acid Soluble)	М	2430	%	0.010	[A] 0.011	[A] < 0.010	[A] < 0.010

Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63. Eurofins Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request. The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

Sample:	Sample Ref:	Sample ID:	Sample Location:	Sampled Date:	Deviation Code(s):	Containers Received:
1021430		1	WS12		А	Plastic Tub 500g
1021431		1	WS06		А	Plastic Tub 500g
1021432		1	WS15		A	Plastic Tub 500g

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	рН	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2175	Total Sulphur in Soils	Total Sulphur	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.

Key

- U UKAS accredited
- M MCERTS and UKAS accredited
- N Unaccredited
- S This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
- SN This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
- T This analysis has been subcontracted to an unaccredited laboratory
- I/S Insufficient Sample
- U/S Unsuitable Sample
- N/E not evaluated
- < "less than"
- > "greater than"

Comments or interpretations are beyond the scope of UKAS accreditation The results relate only to the items tested Uncertainty of measurement for the determinands tested are available upon request None of the results in this report have been recovery corrected All results are expressed on a dry weight basis The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols For all other tests the samples were dried at < 37°C prior to analysis All Asbestos testing is performed at the indicated laboratory Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

- A Date of sampling not supplied
- B Sample age exceeds stability time (sampling to extraction)
- C Sample not received in appropriate containers
- D Broken Container
- E Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt All water samples will be retained for 14 days from the date of receipt Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com



Chemtest



Eurofins Chemtest Ltd. Depot Road Newmarket CB8 0AL Tel: 01638 606070 Email: info@chemtest.com

Report No.:	20-15917-1		
Initial Date of Issue:	01-Jul-2020		
Client	Quantum Geotechnic Ltd		
Client Address:	Plas Newydd Llanedi Pontarddulais Swansea SA4 0FQ		
Contact(s):	Phil Darby		
Project	Q0269 Llantarnam 3G Pitches		
Quotation No.:	Q20-20396	Date Received:	24-Jun-2020
Order No.:		Date Instructed:	24-Jun-2020
No. of Samples:	5		
Turnaround (Wkdays):	5	Results Due:	01-Jul-2020
Date Approved:	01-Jul-2020		
Approved By:			
My Mary			

Details:

Glynn Harvey, Technical Manager

Client: Quantum Geotechnic Ltd	Chemtest Job No.:				ob No.:	20-15917	20-15917	20-15917
Quotation No.: Q20-20396				st Sam		1021412	1021416	1021418
Order No.:				nt Samp		2	1	1
				ample Lo		WS02	WS08	WS10
				Sampl	e Type:	SOIL	SOIL	SOIL
				Top De	oth (m):	0.3	0.2	0.2
			Bot	tom De	oth (m):	0.5	0.4	0.4
				Date Sa		05-Jun-2020	05-Jun-2020	05-Jun-2020
Determinand	Accred.	SOP	Туре	Units	LOD			
рН	U	1010	10:1		N/A	8.8	7.6	7.2
Ammonium	U	1220	10:1	mg/l	0.050	0.19	0.098	0.092
Sulphate	U	1220	10:1	mg/l	1.0	5.4	< 1.0	1.4
Cyanide (Total)	U	1300	10:1	mg/l	0.050	< 0.050	< 0.050	< 0.050
Cyanide (Free)	U	1300	10:1	mg/l	0.050	< 0.050	< 0.050	< 0.050
Sulphide	U	1325	10:1	mg/l	0.050	< 0.050	< 0.050	< 0.050
Arsenic (Dissolved)	U	1450	10:1	µg/l	1.0	< 1.0	< 1.0	< 1.0
Boron (Dissolved)	U	1450	10:1	µg/l	20	< 20	< 20	< 20
Cadmium (Dissolved)	U	1450	10:1	µg/l	0.080	< 0.080	< 0.080	< 0.080
Copper (Dissolved)	U	1450	10:1	µg/l	1.0	3.9	2.1	< 1.0
Mercury (Dissolved)	U	1450	10:1	µg/l	0.50	< 0.50	< 0.50	< 0.50
Nickel (Dissolved)	U	1450	10:1	µg/l	1.0	< 1.0	< 1.0	< 1.0
Lead (Dissolved)	U	1450	10:1	µg/l	1.0	1.5	1.6	< 1.0
Selenium (Dissolved)	U	1450	10:1	µg/l	1.0	3.6	< 1.0	< 1.0
Vanadium (Dissolved)	U	1450	10:1	µg/l	1.0	< 1.0	< 1.0	< 1.0
Zinc (Dissolved)	U	1450	10:1	µg/l	1.0	5.1	3.4	< 1.0
Chromium (Total)	U	1450	10:1	µg/l	1.0	< 1.0	< 1.0	< 1.0
Chromium (Hexavalent)	U	1490	10:1	µg/l	20	[B] < 20	[B] < 20	[B] < 20
Total TPH >C10-C40	U	1670	10:1	µg/l	10	[B] < 10	[B] < 10	[B] < 10
Naphthalene	U	1700	10:1	µg/l	0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene	U	1700	10:1	µg/l	0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	U	1700	10:1	µg/l	0.10	< 0.10	< 0.10	< 0.10
Fluorene	U	1700	10:1	µg/l	0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	U	1700	10:1	µg/l	0.10	< 0.10	< 0.10	< 0.10
Anthracene	U	1700	10:1	µg/l	0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	U	1700	10:1	µg/l	0.10	< 0.10	< 0.10	< 0.10
Pyrene	U	1700	10:1	µg/l	0.10	< 0.10	< 0.10	< 0.10
Benzo[a]anthracene	U	1700	10:1	µg/l	0.10	< 0.10	< 0.10	< 0.10
Chrysene	N	1700	10:1	µg/l	0.10	< 0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	U	1700	10:1	µg/l	0.10	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	U	1700	10:1	µg/l	0.10	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene	U	1700	10:1	µg/l	0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	1700	10:1	µg/l	0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	U	1700	10:1	µg/l	0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	1700	10:1	µg/l	0.10	< 0.10	< 0.10	< 0.10
Total Of 16 PAH's	N	1700	10:1	µg/l	2.0	< 2.0	< 2.0	< 2.0
Benzene	U	1760	10:1	µg/l	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Toluene	U	1760	10:1	µg/l	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0

Results - Leachate

Client: Quantum Geotechnic Ltd			Chei	ntest Jo	ob No.:	20-15917	20-15917	20-15917
Quotation No.: Q20-20396				st Sam		1021412	1021416	1021418
Order No.:			Clier	nt Samp	le Ref.:	2	1	1
			Sa	ample Lo	ocation:	WS02	WS08	WS10
				Sampl	e Type:	SOIL	SOIL	SOIL
	Top Depth (m):		0.3	0.2	0.2			
			Bottom Depth (m):			0.5	0.4	0.4
				Date Sa	ampled:	05-Jun-2020	05-Jun-2020	05-Jun-2020
Determinand	Accred.	SOP	Туре	Units	LOD			
Ethylbenzene	U	1760	10:1	µg/l	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
m & p-Xylene	U	1760	10:1	µg/l	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
o-Xylene	U	1760	10:1	µg/l	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Total Phenols	U	1920	10:1	mg/l	0.030	< 0.030	< 0.030	< 0.030

Client: Quantum Geotechnic Ltd		Che	ntest Jo	ob No.:	20-15917	20-15917	20-15917	20-15917	20-15917
Quotation No.: Q20-20396	(Chemte	st Sam	ple ID.:	1021412	1021413	1021414	1021416	1021418
Order No.:		Clie	nt Samp	le Ref.:	2	1	1	1	1
		Sa	ample Lo	ocation:	WS02	WS05	WS06	WS08	WS10
				е Туре:	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Dep	oth (m):	0.3	0.0	0.15	0.2	0.2
		Bot	tom Dep	oth (m):	0.5	0.25	0.45	0.4	0.4
			Date Sa	ampled:	05-Jun-2020	05-Jun-2020	05-Jun-2020	05-Jun-2020	05-Jun-2020
			Asbest	os Lab:	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD					
АСМ Туре	U	2192		N/A	-	-	-	-	-
Asbestos Identification	U	2192	%	0.001	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
ACM Detection Stage	U	2192		N/A	-	-	-	-	-
Moisture	N	2030	%	0.020	15	15	6.4	13	6.1
pH	U	2010		4.0	6.9	7.3	7.0	7.2	7.1
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	0.59	0.70	0.83	0.51	< 0.40
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010	0.049	0.048	0.089	0.025	0.012
Total Sulphur	U	2175	%	0.010	0.035	0.053	0.24	0.14	0.050
Cyanide (Total)	U	2300	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
Thiocyanate	U	2300	mg/kg	5.0	[B] < 5.0	[B] < 5.0	[B] < 5.0	[B] < 5.0	[B] < 5.0
Sulphide (Easily Liberatable)	N	2325	mg/kg	0.50	2.8	510	5.0	240	47
Iron (Available)	N	2430	mg/kg	20.0	1200	1500	1100	1100	570
Arsenic	U	2450	mg/kg	1.0	11	12	12	12	7.6
Barium	U	2450	mg/kg	10	130	160	570	350	170
Beryllium	U	2450	mg/kg	1.0	< 1.0	< 1.0	5.5	1.7	1.3
Cadmium	U	2450	mg/kg	0.10	0.25	0.32	0.28	0.32	0.17
Chromium	U	2450	mg/kg	1.0	20	25	25	32	25
Copper	U	2450	mg/kg	0.50	24	28	22	21	17
Mercury	U	2450	mg/kg	0.10	< 0.10	< 0.10	< 0.10	0.10	< 0.10
Nickel	U	2450	mg/kg	0.50	22	25	25	28	26
Selenium	U	2450	mg/kg	0.20	0.58	0.51	0.81	0.71	0.35
Vanadium	U	2450	mg/kg	5.0	29	36	140	81	45
Zinc	U	2450	mg/kg	0.50	110	120	78	110	63
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Organic Matter	U	2625	%	0.40	2.6	3.5	1.9	1.9	0.90
TPH >C6-C10	N	2670	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
TPH >C10-C21	N	2670	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
TPH >C21-C40	N	2670	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Total TPH >C6-C40	U	2670	mg/kg	10	[B] < 10	[B] < 10	[B] < 10	[B] < 10	[B] < 10
Naphthalene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	U		mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

Client: Quantum Geotechnic Ltd			mtest Jo		20-15917	20-15917	20-15917	20-15917	20-15917
Quotation No.: Q20-20396	(Chemte	est Sam	ple ID.:	1021412	1021413	1021414	1021416	1021418
Order No.:		Clie	nt Samp	le Ref.:	2	1	1	1	1
		Sa	ample Lo	ocation:	WS02	WS05	WS06	WS08	WS10
			Sample	e Type:	SOIL	SOIL	SOIL	SOIL	SOIL
			Тор Dep		0.3	0.0	0.15	0.2	0.2
		Bot	tom Dep	oth (m):	0.5	0.25	0.45	0.4	0.4
			Date Sa	ampled:	05-Jun-2020	05-Jun-2020	05-Jun-2020	05-Jun-2020	05-Jun-2020
			Asbest	os Lab:	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD					
Pyrene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]anthracene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Of 16 PAH's	U	2700	mg/kg	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Dichlorodifluoromethane	U	2760	µg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Chloromethane	U	2760	µg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Vinyl Chloride	U	2760	µg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Bromomethane	U	2760	µg/kg	20	[B] < 20	[B] < 20	[B] < 20	[B] < 20	[B] < 20
Chloroethane	U	2760	µg/kg	2.0	[B] < 2.0	[B] < 2.0	[B] < 2.0	[B] < 2.0	[B] < 2.0
Trichlorofluoromethane	U	2760	µg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
1,1-Dichloroethene	U	2760	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Trans 1,2-Dichloroethene	U	2760	mg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
1,1-Dichloroethane	U	2760	µg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
cis 1,2-Dichloroethene	U	2760	µg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Bromochloromethane	U	2760	µg/kg	5.0	[B] < 5.0	[B] < 5.0	[B] < 5.0	[B] < 5.0	[B] < 5.0
Trichloromethane	U	2760	µg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
1,1,1-Trichloroethane	U	2760	µg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Tetrachloromethane	U	2760	µg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
1,1-Dichloropropene	U	2760	µg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Benzene	U	2760	µg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
1,2-Dichloroethane	U	2760	µg/kg	2.0	[B] < 2.0	[B] < 2.0	[B] < 2.0	[B] < 2.0	[B] < 2.0
Trichloroethene	N	2760	µg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
1,2-Dichloropropane	U	2760	µg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Dibromomethane	U	2760	µg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Bromodichloromethane	U	2760	µg/kg	5.0	[B] < 5.0	[B] < 5.0	[B] < 5.0	[B] < 5.0	[B] < 5.0
cis-1,3-Dichloropropene	N	2760	µg/kg	10	[B] < 10	[B] < 10	[B] < 10	[B] < 10	[B] < 10
Toluene	U	2760	µg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Trans-1,3-Dichloropropene	N	2760	µg/kg	10	[B] < 10	[B] < 10	[B] < 10	[B] < 10	[B] < 10
1,1,2-Trichloroethane	U	2760	µg/kg	10	[B] < 10	[B] < 10	[B] < 10	[B] < 10	[B] < 10
Tetrachloroethene	U	2760	µg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
1,3-Dichloropropane	U	2760	µg/kg	2.0	[B] < 2.0	[B] < 2.0	[B] < 2.0	[B] < 2.0	[B] < 2.0

Client: Quantum Geotechnic Ltd		Che	mtest Jo	ob No.:	20-15917	20-15917	20-15917	20-15917	20-15917
Quotation No.: Q20-20396		Chemte	st Sam	ple ID.:	1021412	1021413	1021414	1021416	1021418
Order No.:		Clie	nt Samp	le Ref.:	2	1	1	1	1
		Sa	ample Lo	ocation:	WS02	WS05	WS06	WS08	WS10
			Sample	e Type:	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Dep		0.3	0.0	0.15	0.2	0.2
		Bot	tom Dep	oth (m):	0.5	0.25	0.45	0.4	0.4
			Date Sa	ampled:	05-Jun-2020	05-Jun-2020	05-Jun-2020	05-Jun-2020	05-Jun-2020
			Asbest	os Lab:	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD					
Dibromochloromethane	U	2760	µg/kg	10	[B] < 10	[B] < 10	[B] < 10	[B] < 10	[B] < 10
1,2-Dibromoethane	U	2760	µg/kg	5.0	[B] < 5.0	[B] < 5.0	[B] < 5.0	[B] < 5.0	[B] < 5.0
Chlorobenzene	U	2760	µg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
1,1,1,2-Tetrachloroethane	U	2760	µg/kg	2.0	[B] < 2.0	[B] < 2.0	[B] < 2.0	[B] < 2.0	[B] < 2.0
Ethylbenzene	U	2760	µg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
m & p-Xylene	U	2760	µg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
o-Xylene	U	2760	µg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Styrene	U	2760	µg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Tribromomethane	U	2760	µg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Isopropylbenzene	U	2760	µg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Bromobenzene	U	2760	µg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
1,2,3-Trichloropropane	N	2760	µg/kg	50	[B] < 50	[B] < 50	[B] < 50	[B] < 50	[B] < 50
N-Propylbenzene	U	2760	µg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
2-Chlorotoluene	U	2760	µg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
1,3,5-Trimethylbenzene	U	2760	µg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
4-Chlorotoluene	U	2760	µg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Tert-Butylbenzene	U	2760	µg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
1,2,4-Trimethylbenzene	U	2760	µg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Sec-Butylbenzene	U	2760	µg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
1,3-Dichlorobenzene	U	2760	µg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
4-Isopropyltoluene	U	2760	µg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
1,4-Dichlorobenzene	U	2760	µg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
N-Butylbenzene	U	2760	µg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
1,2-Dichlorobenzene	U	2760	µg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
1,2-Dibromo-3-Chloropropane	U	2760	µg/kg	50	[B] < 50	[B] < 50	[B] < 50	[B] < 50	[B] < 50
1,2,4-Trichlorobenzene	U	2760	µg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Hexachlorobutadiene	U	2760	µg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
1,2,3-Trichlorobenzene	U	2760	µg/kg	2.0	[B] < 2.0	[B] < 2.0	[B] < 2.0	[B] < 2.0	[B] < 2.0
Methyl Tert-Butyl Ether	U	2760	µg/kg	1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
N-Nitrosodimethylamine	U	2790	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
Phenol	U	2790	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
2-Chlorophenol	U	2790	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
Bis-(2-Chloroethyl)Ether	U	2790	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
1,3-Dichlorobenzene	U	2790	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
1,4-Dichlorobenzene	N	2790	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
1,2-Dichlorobenzene	U	2790	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
2-Methylphenol	U	2790	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50

Client: Quantum Geotechnic Ltd			mtest Jo		20-15917	20-15917	20-15917	20-15917	20-15917
Quotation No.: Q20-20396	(Chemte	est Sam	ple ID.:	1021412	1021413	1021414	1021416	1021418
Order No.:		Clie	nt Samp	le Ref.:	2	1	1	1	1
		Sa	ample Lo	ocation:	WS02	WS05	WS06	WS08	WS10
			Sample	e Type:	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Dep	oth (m):	0.3	0.0	0.15	0.2	0.2
		Bot	tom Dep	oth (m):	0.5	0.25	0.45	0.4	0.4
			Date Sa	ampled:	05-Jun-2020	05-Jun-2020	05-Jun-2020	05-Jun-2020	05-Jun-2020
			Asbest	os Lab:	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD					
Bis(2-Chloroisopropyl)Ether	U	2790	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
Hexachloroethane	N	2790	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
N-Nitrosodi-n-propylamine	U	2790	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
4-Methylphenol	U	2790		0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
Nitrobenzene	U	2790	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
Isophorone	U	2790	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
2-Nitrophenol	N	2790	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
2,4-Dimethylphenol	N	2790	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
Bis(2-Chloroethoxy)Methane	U	2790	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
2,4-Dichlorophenol	U	2790	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
1,2,4-Trichlorobenzene	U	2790	mg/kg	0.50	[B] < 0.50	[B] < 0.50 [B] < 0.50	[B] < 0.50 [B] < 0.50	[B] < 0.50 [B] < 0.50	[B] < 0.50 [B] < 0.50
	U	2790				[B] < 0.50 [B] < 0.50		[B] < 0.50 [B] < 0.50	
Naphthalene	0		mg/kg	0.50	[B] < 0.50		[B] < 0.50		[B] < 0.50
4-Chloroaniline	U	2790	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
Hexachlorobutadiene	-	2790	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
4-Chloro-3-Methylphenol	U	2790	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
2-Methylnaphthalene	U	2790	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
4-Nitrophenol	N	2790	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
Hexachlorocyclopentadiene	N	2790	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
2,4,6-Trichlorophenol	U	2790	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
2,4,5-Trichlorophenol	U	2790	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
2-Chloronaphthalene	U	2790	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
2-Nitroaniline	U	2790	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
Acenaphthylene	U	2790	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
Dimethylphthalate	U	2790	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
2,6-Dinitrotoluene	U	2790	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
Acenaphthene	U	2790	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
3-Nitroaniline	N	2790	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
Dibenzofuran	U	2790	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
4-Chlorophenylphenylether	U	2790	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
2,4-Dinitrotoluene	U	2790	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
Fluorene	U	2790	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
Diethyl Phthalate	U	2790	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
4-Nitroaniline	U	2790	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
2-Methyl-4,6-Dinitrophenol	N	2790	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
Azobenzene	U	2790	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
4-Bromophenylphenyl Ether	U	2790	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
Hexachlorobenzene	U	2790	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50

Client: Quantum Geotechnic Ltd		Che	mtest Jo	b No.:	20-15917	20-15917	20-15917	20-15917	20-15917
Quotation No.: Q20-20396	(Chemte	st Sam	ole ID.:	1021412	1021413	1021414	1021416	1021418
Order No.:		Clie	nt Samp	le Ref.:	2	1	1	1	1
		Sa	ample Lo	ocation:	WS02	WS05	WS06	WS08	WS10
			Sample	e Type:	SOIL	SOIL	SOIL	SOIL	SOIL
			Тор Dep	oth (m):	0.3	0.0	0.15	0.2	0.2
		Bot	tom Dep	oth (m):	0.5	0.25	0.45	0.4	0.4
			Date Sa	mpled:	05-Jun-2020	05-Jun-2020	05-Jun-2020	05-Jun-2020	05-Jun-2020
			Asbest	os Lab:	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD					
Pentachlorophenol	N	2790	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
Phenanthrene	U	2790	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
Anthracene	U	2790	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
Carbazole	U	2790	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
Di-N-Butyl Phthalate	U	2790	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
Fluoranthene	U	2790	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
Pyrene	U	2790	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
Butylbenzyl Phthalate	U	2790	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
Benzo[a]anthracene	U	2790	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
Chrysene	U	2790	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
Bis(2-Ethylhexyl)Phthalate	N	2790	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
Di-N-Octyl Phthalate	U	2790	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
Benzo[b]fluoranthene	U	2790	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
Benzo[k]fluoranthene	U	2790	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
Benzo[a]pyrene	U	2790	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
Indeno(1,2,3-c,d)Pyrene	U	2790	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
Dibenz(a,h)Anthracene	U	2790	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
Benzo[g,h,i]perylene	U	2790	mg/kg	0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50	[B] < 0.50
Total Phenols	U	2920	mg/kg	0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30

Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63. Eurofins Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request. The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

Sample:	Sample Ref:	Sample ID:	Sample Location:	Sampled Date:	Deviation Code(s):	Containers Received:
1021412	2		WS02	05-Jun-2020	В	Amber Glass 250ml
1021412	2		WS02	05-Jun-2020	В	Amber Glass 60ml
1021412	2		WS02	05-Jun-2020	В	Plastic Tub 500g
1021413	1		WS05	05-Jun-2020	В	Amber Glass 250ml
1021413	1		WS05	05-Jun-2020	В	Amber Glass 60ml
1021413	1		WS05	05-Jun-2020	В	Plastic Tub 500g
1021414	1		WS06	05-Jun-2020	В	Amber Glass 250ml
1021414	1		WS06	05-Jun-2020	В	Amber Glass 60ml
1021414	1		WS06	05-Jun-2020	В	Plastic Tub 500g
1021416	1		WS08	05-Jun-2020	В	Amber Glass 250ml
1021416	1		WS08	05-Jun-2020	В	Amber Glass 60ml
1021416	1		WS08	05-Jun-2020	В	Plastic Tub 500g
1021418	1		WS10	05-Jun-2020	В	Amber Glass 250ml
1021418	1		WS10	05-Jun-2020	В	Amber Glass 60ml
1021418	1		WS10	05-Jun-2020	В	Plastic Tub 500g

Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63. Eurofins Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request. The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

Sample: Sample Ref: Sample ID:	Sample Location:	Sampled Date:	Deviation Code(s):	Containers Received:
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Test Methods

SOP	Title	Parameters included	Method summary		
1010	pH Value of Waters	рН	pH Meter		
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.		
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.		
1325	Sulphide in Waters	Sulphides	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using N,N–dimethyl- pphenylenediamine.		
1450	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).		
1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5- diphenylcarbazide.		
1670	Total Petroleum Hydrocarbons (TPH) in Waters by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3- band – GRO, DRO & LRO	Pentane extraction / GC FID detection		
1700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)		
1760	Volatile Organic Compounds (VOCs) in Waters by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics. (cf. USEPA Method 8260)	Automated headspace gas chromatographic (GC) analysis of water samples with mass spectrometric (MS) detection of volatile organic compounds.		
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.		
2010	pH Value of Soils	рН	pH Meter		
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.		
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930		
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES		
2175	Total Sulphur in Soils	Total Sulphur	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.		
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry		
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.		
2325	Sulphide in Soils	Sulphide	Steam distillation with sulphuric acid / analysis by 'Aquakem 600' Discrete Analyser, using N,N–dimethyl-p-phenylenediamine.		
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.		
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.		

Test Methods

SOP	Title	Parameters included	Method summary
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3- band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2790	Semi-Volatile Organic Compounds (SVOCs) in Soils by GC-MS	Semi-volatile organic compounds(cf. USEPA Method 8270)	Acetone/Hexane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1- Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Key

- U UKAS accredited
- M MCERTS and UKAS accredited
- N Unaccredited
- S This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
- SN This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
- T This analysis has been subcontracted to an unaccredited laboratory
- I/S Insufficient Sample
- U/S Unsuitable Sample
- N/E not evaluated
- < "less than"
- > "greater than"

Comments or interpretations are beyond the scope of UKAS accreditation The results relate only to the items tested Uncertainty of measurement for the determinands tested are available upon request None of the results in this report have been recovery corrected All results are expressed on a dry weight basis The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols For all other tests the samples were dried at < 37°C prior to analysis All Asbestos testing is performed at the indicated laboratory Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

- A Date of sampling not supplied
- B Sample age exceeds stability time (sampling to extraction)
- C Sample not received in appropriate containers
- D Broken Container
- E Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt All water samples will be retained for 14 days from the date of receipt Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com



Chemtest Ltd. Depot Road Newmarket CB8 0AL Tel: 01638 606070 Email: info@chemtest.com

Report No.:	20-15137-1		
Initial Date of Issue:	30-Jun-2020		
Client	Quantum Geotechnic Ltd		
Client Address:	Plas Newydd Llanedi Pontarddulais Swansea SA4 0FQ		
Contact(s):	Phil Darby		
Project	Q0269 LLantarnam 3G Pitch		
Quotation No.:	Q20-20396	Date Received:	16-Jun-2020
Order No.:		Date Instructed:	23-Jun-2020
No. of Samples:	2		
Turnaround (Wkdays):	5	Results Due:	29-Jun-2020
Date Approved:	30-Jun-2020		
Approved By:			
Ulp Mary			

Details:

Glynn Harvey, Technical Manager

Client: Quantum Geotechnic Ltd		Chemtest Job No.:				20-15137
Quotation No.: Q20-20396		Chem	test Sam	ple ID.:	1017806	1017807
Order No.:			ient Samp		EW1	EW1
			Sample Lo		WS1	WS15
		Sample Type: Top Depth (m):		WATER	WATER	
				1.38	1.81	
			Date Sa	ampled:	15-Jun-2020	15-Jun-2020
Determinand	Accred.	SOP	Units	LOD		
рН	U	1010		N/A	8.6	8.2
Biochemical Oxygen Demand	N	1090	mg O2/l	4.0	[B] < 4.0	[B] < 4.0
Chemical Oxygen Demand	U	1100	mg O2/l	10	16	13
Sulphur	N	1220	mg/l	1.0	8.7	< 1.0
Sulphate	U	1220	mg/l	1.0	26	2.4
Cyanide (Total)	U	1300	mg/l	0.050	< 0.050	< 0.050
Thiocyanate	U	1300	mg/l	0.50	< 0.50	< 0.50
Sulphide	U	1325	mg/l	0.050	[B] < 0.050	[B] < 0.050
Total Hardness as CaCO3	U	1270	mg/l	15	120	89
Arsenic (Dissolved)	U	1450	µg/l	1.0	< 1.0	3.8
Boron (Dissolved)	U	1450	µg/l	20	24	< 20
Barium (Dissolved)	U	1450	µg/l	5.0	71	230
Beryllium (Dissolved)	U	1450	µg/l	1.0	< 1.0	< 1.0
Cadmium (Dissolved)	U	1450	µg/l	0.080	< 0.080	< 0.080
Chromium (Dissolved)	U	1450	µg/l	1.0	3.5	< 1.0
Copper (Dissolved)	U	1450	µg/l	1.0	1.9	< 1.0
Iron (Dissolved)	N	1450	µg/l	20	86	11000
Mercury (Dissolved)	U	1450	µg/l	0.50	< 0.50	< 0.50
Nickel (Dissolved)	U	1450	µg/l	1.0	3.9	6.3
Lead (Dissolved)	U	1450	µg/l	1.0	< 1.0	< 1.0
Selenium (Dissolved)	U	1450	µg/l	1.0	< 1.0	< 1.0
Vanadium (Dissolved)	U	1450	µg/l	1.0	< 1.0	< 1.0
Zinc (Dissolved)	U	1450	µg/l	1.0	24	9.0
Chromium (Hexavalent)	U	1490	µg/l	20	< 20	< 20
Dissolved Organic Carbon	U	1610	mg/l	2.0	4.3	4.9
Total Organic Carbon	U	1610	mg/l	2.0	4.6	5.2
TPH >C6-C10	N	1670	µg/l	0.10	< 0.10	< 0.10
TPH >C10-C21	N	1670	µg/l	0.10	< 0.10	< 0.10
TPH >C21-C40	N	1670	µg/l	0.10	< 0.10	< 0.10
Total TPH >C6-C40	U	1670	µg/l	10	< 10	< 10
Naphthalene	U	1700	µg/l	0.10	< 0.10	< 0.10
Acenaphthylene	U	1700	µg/l	0.10	< 0.10	< 0.10
Acenaphthene	U	1700	µg/l	0.10	< 0.10	< 0.10
Fluorene	U	1700	µg/l	0.10	< 0.10	< 0.10
Phenanthrene	U	1700	µg/l	0.10	< 0.10	< 0.10
Anthracene	U	1700	µg/l	0.10	< 0.10	< 0.10
Fluoranthene	U	1700	µg/l	0.10	< 0.10	< 0.10
Pyrene	U	1700	µg/l	0.10	< 0.10	< 0.10
Benzo[a]anthracene	U	1700	µg/l	0.10	< 0.10	< 0.10

Client: Quantum Geotechnic Ltd		Ch	emtest J	20-15137	20-15137	
Quotation No.: Q20-20396		Chem	test Sam	ple ID.:	1017806	1017807
Order No.:		Cli	ent Samp	le Ref.:	EW1	EW1
		ç	Sample Lo		WS1	WS15
			Sampl	WATER	WATER	
			Top De		1.38	1.81
		-	Date Sa	ampled:	15-Jun-2020	15-Jun-2020
Determinand	Accred.	SOP	Units	LOD		
Chrysene	N	1700	µg/l	0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	U	1700	µg/l	0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	U	1700	µg/l	0.10	< 0.10	< 0.10
Benzo[a]pyrene	U	1700	µg/l	0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	1700	µg/l	0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	U	1700	µg/l	0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	1700	µg/l	0.10	< 0.10	< 0.10
Total Of 16 PAH's	N	1700	µg/l	2.0	< 2.0	< 2.0
Dichlorodifluoromethane	U	1760	µg/l	1.0	< 1.0	< 1.0
Chloromethane	U	1760	µg/l	1.0	< 1.0	< 1.0
Vinyl Chloride	N	1760	µg/l	1.0	< 1.0	< 1.0
Bromomethane	U	1760	µg/l	5.0	< 5.0	< 5.0
Chloroethane	U	1760	µg/l	2.0	< 2.0	< 2.0
Trichlorofluoromethane	U	1760	µg/l	1.0	< 1.0	< 1.0
1,1-Dichloroethene	U	1760	µg/l	1.0	< 1.0	< 1.0
Trans 1,2-Dichloroethene	U	1760	µg/l	1.0	< 1.0	< 1.0
1,1-Dichloroethane	U	1760	µg/l	1.0	< 1.0	< 1.0
cis 1,2-Dichloroethene	U	1760	µg/l	1.0	< 1.0	< 1.0
Bromochloromethane	U	1760	µg/l	5.0	< 5.0	< 5.0
Trichloromethane	U	1760	µg/l	1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	U	1760	µg/l	1.0	< 1.0	< 1.0
Tetrachloromethane	U	1760	µg/l	1.0	< 1.0	< 1.0
1,1-Dichloropropene	U	1760	µg/l	1.0	< 1.0	< 1.0
Benzene	U	1760	µg/l	1.0	< 1.0	< 1.0
1,2-Dichloroethane	U	1760	µg/l	2.0	< 2.0	< 2.0
Trichloroethene	N	1760	µg/l	1.0	< 1.0	< 1.0
1,2-Dichloropropane	U	1760	µg/l	1.0	< 1.0	< 1.0
Dibromomethane	U	1760	µg/l	10	< 10	< 10
Bromodichloromethane	U	1760	µg/l	5.0	< 5.0	< 5.0
cis-1,3-Dichloropropene	N	1760	µg/l	10	< 10	< 10
Toluene	U	1760	µg/l	1.0	< 1.0	< 1.0
Trans-1,3-Dichloropropene	N	1760	µg/l	10	< 10	< 10
1,1,2-Trichloroethane	U	1760	µg/l	10	< 10	< 10
Tetrachloroethene	U	1760	µg/l	1.0	< 1.0	< 1.0
1,3-Dichloropropane	U	1760	µg/l	2.0	< 2.0	< 2.0
Dibromochloromethane	U	1760	µg/l	10	< 10	< 10
1,2-Dibromoethane	U	1760	µg/l	5.0	< 5.0	< 5.0
Chlorobenzene	N	1760	µg/l	1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	U	1760	µg/l	2.0	< 2.0	< 2.0

Client: Quantum Geotechnic Ltd	Chemtest Job No.:				20-15137	20-15137
Quotation No.: Q20-20396		Chem	test Sam	ple ID.:	1017806	1017807
Order No.:			ent Samp		EW1	EW1
		5	Sample Lo		WS1	WS15
			Sampl	WATER	WATER	
			Top De		1.38	1.81
			Date Sa	<u> </u>	15-Jun-2020	15-Jun-2020
Determinand	Accred.	SOP	Units	LOD		
Ethylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0
m & p-Xylene	U	1760	µg/l	1.0	< 1.0	< 1.0
o-Xylene	U	1760	µg/l	1.0	< 1.0	< 1.0
Styrene	U	1760	µg/l	1.0	< 1.0	< 1.0
Tribromomethane	U	1760	µg/l	1.0	< 1.0	< 1.0
Isopropylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0
Bromobenzene	U	1760	µg/l	1.0	< 1.0	< 1.0
1,2,3-Trichloropropane	N	1760	µg/l	50	< 50	< 50
N-Propylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0
2-Chlorotoluene	U	1760	µg/l	1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0
4-Chlorotoluene	U	1760	µg/l	1.0	< 1.0	< 1.0
Tert-Butylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0
Sec-Butylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	N	1760	µg/l	1.0	< 1.0	< 1.0
4-Isopropyltoluene	U	1760	µg/l	1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	U	1760	µg/l	1.0	< 1.0	< 1.0
N-Butylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0
1,2-Dichlorobenzene	U	1760	µg/l	1.0	< 1.0	< 1.0
1,2-Dibromo-3-Chloropropane	U	1760	µg/l	50	< 50	< 50
1,2,4-Trichlorobenzene	U	1760	µg/l	1.0	< 1.0	< 1.0
Hexachlorobutadiene	U	1760	µg/l	1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene	U	1760	µg/l	2.0	< 2.0	< 2.0
Methyl Tert-Butyl Ether	N	1760	µg/l	1.0	< 1.0	< 1.0
N-Nitrosodimethylamine	N	1790	µg/l	0.50	< 0.50	< 0.50
Phenol	N	1790	µg/l	0.50	< 0.50	< 0.50
2-Chlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50
Bis-(2-Chloroethyl)Ether	N	1790	µg/l	0.50	< 0.50	< 0.50
1,3-Dichlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50
1,4-Dichlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50
1,2-Dichlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50
2-Methylphenol (o-Cresol)	N	1790	µg/l	0.50	< 0.50	< 0.50
Bis(2-Chloroisopropyl)Ether	N	1790	µg/l	0.50	< 0.50	< 0.50
Hexachloroethane	N	1790	µg/l	0.50	< 0.50	< 0.50
N-Nitrosodi-n-propylamine	N	1790	µg/l	0.50	< 0.50	< 0.50
4-Methylphenol	N	1790	µg/l	0.50	< 0.50	< 0.50
Nitrobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50
Isophorone	N	1790	µg/l	0.50	< 0.50	< 0.50

Client: Quantum Geotechnic Ltd		Ch	emtest J	20-15137	20-15137	
Quotation No.: Q20-20396		Chem	test Sam	1017806	1017807	
Order No.:		Cli	ent Samp	ole Ref.:	EW1	EW1
		5	Sample Lo	WS1	WS15	
			Sampl	WATER	WATER	
			Top De	1.38	1.81	
				ampled:	15-Jun-2020	15-Jun-2020
Determinand	Accred.	SOP	Units	LOD		
2-Nitrophenol	N	1790	µg/l	0.50	< 0.50	< 0.50
2,4-Dimethylphenol	N	1790	µg/l	0.50	< 0.50	< 0.50
Bis(2-Chloroethoxy)Methane	N	1790	µg/l	0.50	< 0.50	< 0.50
2,4-Dichlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50
1,2,4-Trichlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50
Naphthalene	N	1790	µg/l	0.50	< 0.50	< 0.50
4-Chloroaniline	N	1790	µg/l	0.50	< 0.50	< 0.50
Hexachlorobutadiene	N	1790	µg/l	0.50	< 0.50	< 0.50
4-Chloro-3-Methylphenol	N	1790	µg/l	0.50	< 0.50	< 0.50
2-Methylnaphthalene	N	1790	µg/l	0.50	< 0.50	< 0.50
Hexachlorocyclopentadiene	N	1790	µg/l	0.50	< 0.50	< 0.50
2,4,6-Trichlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50
2,4,5-Trichlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50
2-Chloronaphthalene	N	1790	µg/l	0.50	< 0.50	< 0.50
2-Nitroaniline	N	1790	µg/l	0.50	< 0.50	< 0.50
Acenaphthylene	N	1790	µg/l	0.50	< 0.50	< 0.50
Dimethylphthalate	N	1790	µg/l	0.50	< 0.50	< 0.50
2,6-Dinitrotoluene	N	1790	µg/l	0.50	< 0.50	< 0.50
Acenaphthene	N	1790	µg/l	0.50	< 0.50	< 0.50
3-Nitroaniline	N	1790	µg/l	0.50	< 0.50	< 0.50
Dibenzofuran	N	1790	µg/l	0.50	< 0.50	< 0.50
4-Chlorophenylphenylether	N	1790	µg/l	0.50	< 0.50	< 0.50
2,4-Dinitrotoluene	N	1790	µg/l	0.50	< 0.50	< 0.50
Fluorene	N	1790	µg/l	0.50	< 0.50	< 0.50
Diethyl Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50
4-Nitroaniline	N	1790	µg/l	0.50	< 0.50	< 0.50
2-Methyl-4,6-Dinitrophenol	N	1790	µg/l	0.50	< 0.50	< 0.50
Azobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50
4-Bromophenylphenyl Ether	N	1790	µg/l	0.50	< 0.50	< 0.50
Hexachlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50
Pentachlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50
Phenanthrene	N	1790	µg/l	0.50	< 0.50	< 0.50
Anthracene	N	1790	µg/l	0.50	< 0.50	< 0.50
Carbazole	N	1790	µg/l	0.50	< 0.50	< 0.50
Di-N-Butyl Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50
Fluoranthene	N	1790	µg/l	0.50	< 0.50	< 0.50
Pyrene	N	1790	µg/l	0.50	< 0.50	< 0.50
Butylbenzyl Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50
Benzo[a]anthracene	N	1790	µg/l	0.50	< 0.50	< 0.50

Client: Quantum Geotechnic Ltd		Ch	emtest J	20-15137	20-15137	
Quotation No.: Q20-20396		1017807				
Order No.:		Cli	ent Samp	le Ref.:	EW1	EW1
		ŝ	Sample Lo	ocation:	WS1	WS15
			Sampl	e Type:	WATER	WATER
			Top De	oth (m):	1.38	1.81
			Date Sa	ampled:	15-Jun-2020	15-Jun-2020
Determinand	Accred.	SOP	Units	LOD		
Chrysene	Ν	1790	µg/l	0.50	< 0.50	< 0.50
Bis(2-Ethylhexyl)Phthalate	Ν	1790	µg/l	0.50	< 0.50	< 0.50
Di-N-Octyl Phthalate	Ν	1790	µg/l	0.50	< 0.50	< 0.50
Benzo[b]fluoranthene	Ν	1790	µg/l	0.50	< 0.50	< 0.50
Benzo[k]fluoranthene	Ν	1790	µg/l	0.50	< 0.50	< 0.50
Benzo[a]pyrene	Ν	1790	µg/l	0.50	< 0.50	< 0.50
Indeno(1,2,3-c,d)Pyrene	Ν	1790	µg/l	0.50	< 0.50	< 0.50
Dibenz(a,h)Anthracene	Ν	1790	µg/l	0.50	< 0.50	< 0.50
Benzo[g,h,i]perylene	Ν	1790	µg/l	0.50	< 0.50	< 0.50
4-Nitrophenol	N	1790	µg/l	0.50	< 0.50	< 0.50
Total Phenols	U	1920	mg/l	0.030	[B] < 0.030	[B] < 0.030



Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63. Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request. The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

Sample:	Sample Ref:	Sample ID:	Sample Location:	Sampled Date:	Deviation Code(s):	Containers Received:
1017806	EW1		WS1	15-Jun-2020	В	Coloured Winchester 1000ml
1017806	EW1		WS1	15-Jun-2020	В	EPA Vial 40ml
1017806	EW1		WS1	15-Jun-2020	В	Plastic Bottle 1000ml
1017807	EW1		WS15	15-Jun-2020	В	Coloured Winchester 1000ml
1017807	EW1		WS15	15-Jun-2020	В	EPA Vial 40ml
1017807	EW1		WS15	15-Jun-2020	В	Plastic Bottle 1000ml



Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	рН	pH Meter
1090	Biochemical Oxygen Demand	Biochemical Oxygen demand (BOD)	Colorimetric determination of dissolved oxygen in seeded sample after 5 days incubation at 20°C.
1100	Chemical Oxygen Demand	Chemical Oxygen demand (COD)	Dichromate oxidation of organic matter in sample followed by colorimetric determination of residual Cr[VI].
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1270	Total Hardness of Waters	Total hardness	Calculation applied to calcium and magnesium results, expressed as mg I-1 CaCO3 equivalent.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1325	Sulphide in Waters	Sulphides	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using N,N–dimethyl- pphenylenediamine.
1415	Cations in Waters by ICP-MS	Sodium; Potassium; Calcium; Magnesium	Direct determination by inductively coupled plasma - mass spectrometry (ICP-MS).
1450	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	determination by inductively coupled plasma
1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5- diphenylcarbazide.
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1670	Total Petroleum Hydrocarbons (TPH) in Waters by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3- band – GRO, DRO & LRO	Pentane extraction / GC FID detection
1700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
1760	Volatile Organic Compounds (VOCs) in Waters by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics. (cf. USEPA Method 8260)	Automated headspace gas chromatographic (GC) analysis of water samples with mass spectrometric (MS) detection of volatile organic compounds.
1790	Semi-Volatile Organic Compounds (SVOCs) in Waters by GC-MS	Semi-volatile organic compounds	Solvent extraction / GCMS detection
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.



Report Information

Key

- U UKAS accredited
- M MCERTS and UKAS accredited
- N Unaccredited
- S This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
- SN This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
- T This analysis has been subcontracted to an unaccredited laboratory
- I/S Insufficient Sample
- U/S Unsuitable Sample
- N/E not evaluated
- < "less than"
- > "greater than"

Comments or interpretations are beyond the scope of UKAS accreditation The results relate only to the items tested Uncertainty of measurement for the determinands tested are available upon request None of the results in this report have been recovery corrected All results are expressed on a dry weight basis The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols For all other tests the samples were dried at < 37°C prior to analysis All Asbestos testing is performed at the indicated laboratory Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

- A Date of sampling not supplied
- B Sample age exceeds stability time (sampling to extraction)
- C Sample not received in appropriate containers
- D Broken Container
- E Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt All water samples will be retained for 14 days from the date of receipt Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com



Chemistry to deliver results The right chemistry to deliver results Chemtest Ltd. Depot Road Newmarket CB8 0AL Tel: 01638 606070 Email: info@chemtest.com

Report No.:	20-14402-1 20-14402-1		
Initial Date of Issue:	22/Jun/2020 22/Jun/2020		
Client	Quantum Geotechnic Ltd Quantum Geotechnic Ltd		
Client Address:	Plas Newydd Llanedi Pontarddulais Swansea SA4 0FQ Plas Newydd Llanedi Pontarddulais Swansea SA4 0FQ		
Contact(s):	Phil Darby Phil Darby		
Project	Q0269 Llantarnam 3G Pitch Q0269 Llantarnam School		
Quotation No.:	Q20-20396 Q20-20396	Date Received:	09/Jun/2020 0§
Order No.:		Date Instructed:	16/Jun/2020 1(
No. of Samples:	6 6		
Turnaround (Wkdays):	5 5	Results Due:	22/Jun/2020 22
Date Approved:	22/Jun/2020 22/Jun/2020		
Approved By:			

Approved By:

Ulun Mary

Details:

Glynn Harvey, Technical Manager

Results - Soil

Client: Quantum Geotechnic Ltd	Chemtest Job No.:				20-14402	20-14402	20-14402	20-14402	20-14402	20-14402
Quotation No.: Q20-20396	Chemtest Sample ID.:			1014479	1014480	1014482	1014487	1014492	1017768	
Order No.:		Clie	nt Samp	le Ref.:	1	1	2	1	2	1
		Sa	ample Lo	ocation:	HP17	HP03	HP05	HP01	HP18	HP05
			Sampl	e Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top De	oth (m):	0.4	0.4	0.8	0.5	1.0	0.3
			Date Sa	ampled:	04-Jun-2020	03-Jun-2020	04-Jun-2020	03-Jun-2020	03-Jun-2020	12-Jun-2020
	Asbestos Lab:			COVENTRY	COVENTRY					
Determinand	Accred.	SOP	Units	LOD						
АСМ Туре	U	2192		N/A	-	-				
Asbestos Identification	U	2192	%	0.001	No Asbestos Detected	No Asbestos Detected				
ACM Detection Stage	U	2192		N/A	-	-				
Moisture	N	2030	%	0.020	10	10	12	11	13	9.1
Soil Colour	N	2040	1	N/A		Brown	Brown	Brown	Brown	Brown
Other Material	N	2040		N/A		Stones	Stones	Stones	Stones	Stones and Roots
Soil Texture	N	2040		N/A		Sand	Sand	Sand	Sand	Sand
pH	М	2010	1	4.0	7.6	7.1				
рН (2.5:1)	N	2010		4.0		7.1	7.4	7.3	7.3	6.9
Boron (Hot Water Soluble)	М	2120	mg/kg	0.40	0.42	< 0.40		-	-	
Sulphate (2:1 Water Soluble) as SO4	М	2120	g/l	0.010	0.19	0.10	0.091	0.097	0.085	< 0.010
Sulphate (2:1 Extract)	М	2120	mg/kg	20		200	180	190	170	< 20
Total Sulphur	М	2175	%	0.010	0.086	0.070	0.043	0.045	0.045	0.026
Cyanide (Total)	M	2300	mg/kg	0.50	17	12				
Thiocyanate	М	2300	mg/kg	5.0	10	9.3				
Sulphide (Easily Liberatable)	N	2325	mg/kg	0.50	56	21				
Sulphate (Acid Soluble)	М	2430	%	0.010		0.093	0.061	0.052	0.054	0.027
Iron (Available)	N	2430	mg/kg	20.0	540	410				
Arsenic	M	2450	mg/kg	1.0	9.2	6.6				
Barium	М	2450	mg/kg	10	140	150				
Beryllium	U	2450	mg/kg	1.0	1.4	< 1.0				
Cadmium	M	2450	mg/kg	0.10	0.21	0.12				
Chromium	М	2450	mg/kg	1.0	25	19				
Copper	M	2450	mg/kg	0.50	18	14				
Mercury	M	2450	mg/kg	0.10	0.13	< 0.10				
Nickel	М	2450	mg/kg	0.50	26	21				
Selenium	M	2450	mg/kg	0.20	0.44	0.53				
Vanadium	U	2450	mg/kg	5.0	39	31				
Zinc	M	2450	mg/kg	0.50	73	55				
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50				
Organic Matter	M	2625	%	0.40	2.4	1.7				
TPH >C6-C10	N	2670	mg/kg	1.0	< 1.0	< 1.0				
TPH >C10-C21	N	2670	mg/kg	1.0	< 1.0	< 1.0				
TPH >C21-C40	N	2670	mg/kg	1.0	< 1.0	< 1.0				
Total TPH >C6-C40	M	2670	mg/kg	1.0	< 10	< 10				
Naphthalene	M		mg/kg	0.10	0.52	0.58				

Results - Soil

Client: Quantum Geotechnic Ltd		Chemtest Job No.:			20-14402	20-14402	20-14402	20-14402	20-14402	20-14402
Quotation No.: Q20-20396	0	Chemtest Sample ID.:		1014479	1014480	1014482	1014487	1014492	1017768	
Order No.:		Client Sample Ref.:		1 HP17	1	2	1	2	1	
		Sample Location:				HP03	HP05	HP01	HP18	HP05
			Sample		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Dep		0.4	0.4	0.8	0.5	1.0	0.3
			Date Sa		04-Jun-2020	03-Jun-2020	04-Jun-2020	03-Jun-2020	03-Jun-2020	12-Jun-2020
			Asbest		COVENTRY	COVENTRY				
Determinand	Accred.	SOP	Units							
Acenaphthylene	М		mg/kg	0.10	1.1	0.81				
Acenaphthene	М	2700	0 0	0.10	0.64	0.55				
Fluorene	М	2700		0.10	1.3	1.0				
Phenanthrene	М	2700		0.10	5.4	4.2				
Anthracene	М	2700		0.10	2.0	1.4				
Fluoranthene	М	2700	mg/kg	0.10	8.3	5.4				
Pyrene	М	2700		0.10	8.1	5.1				
Benzo[a]anthracene	М	2700	0 0	0.10	3.6	2.1				
Chrysene	М		mg/kg	0.10	3.6	2.0				
Benzo[b]fluoranthene	М		mg/kg	0.10	5.8	3.2				
Benzo[k]fluoranthene	М	2700	0	0.10	2.3	1.3				
Benzo[a]pyrene	М	2700	0 0	0.10	4.5	2.1				
Indeno(1,2,3-c,d)Pyrene	М	2700	mg/kg	0.10	3.8	1.9				
Dibenz(a,h)Anthracene	М	2700	mg/kg	0.10	0.91	0.57				
Benzo[g,h,i]perylene	М	2700	mg/kg	0.10	4.1	2.2				
Total Of 16 PAH's	М	2700	mg/kg	2.0	56	34				
Dichlorodifluoromethane	U	2760		1.0	< 1.0	< 1.0				
Chloromethane	М	2760	µg/kg	1.0	< 1.0	< 1.0				
Vinyl Chloride	М	2760	µg/kg	1.0	< 1.0	< 1.0				
Bromomethane	М	2760	µg/kg	20	< 20	< 20				
Chloroethane	U	2760	µg/kg	2.0	< 2.0	< 2.0				
Trichlorofluoromethane	М	2760		1.0	< 1.0	< 1.0				
1,1-Dichloroethene	М	2760	mg/kg	1.0	< 1.0	< 1.0				
Trans 1,2-Dichloroethene	М	2760	mg/kg	1.0	< 1.0	< 1.0				
1,1-Dichloroethane	М	2760	µg/kg	1.0	< 1.0	< 1.0				
cis 1,2-Dichloroethene	М	2760	µg/kg	1.0	< 1.0	< 1.0				
Bromochloromethane	U	2760	µg/kg	5.0	< 5.0	< 5.0				
Trichloromethane	М	2760	µg/kg	1.0	< 1.0	< 1.0				
1,1,1-Trichloroethane	М	2760	µg/kg	1.0	< 1.0	< 1.0				
Tetrachloromethane	М	2760	µg/kg	1.0	< 1.0	< 1.0				
1,1-Dichloropropene	U	2760	µg/kg	1.0	< 1.0	< 1.0				
Benzene	М	2760	µg/kg	1.0	< 1.0	< 1.0				
1,2-Dichloroethane	М	2760	µg/kg	2.0	< 2.0	< 2.0				
Trichloroethene	N	2760	µg/kg	1.0	< 1.0	< 1.0				
1,2-Dichloropropane	М	2760	10 0	1.0	< 1.0	< 1.0				
Dibromomethane	М	2760	µg/kg	1.0	< 1.0	< 1.0				
Bromodichloromethane	М	2760	µg/kg	5.0	< 5.0	< 5.0				
cis-1,3-Dichloropropene	N	2760	µg/kg	10	< 10	< 10				

Results - Soil

Client: Quantum Geotechnic Ltd			mtest Jo		20-14402	20-14402	20-14402	20-14402	20-14402	20-14402	
Quotation No.: Q20-20396	0	Chemtest Sample ID.:		1014479	1014480	1014482	1014487	1014492	1017768		
Order No.:		Clie	nt Samp	le Ref.:	1	1	2	1	2	1	
				Sample Location:		HP17	HP03	HP05	HP01	HP18	HP05
		Sample Type: Top Depth (m):			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	
					0.4	0.4	0.8	0.5	1.0	0.3	
			Date Sa	mpled:	04-Jun-2020	03-Jun-2020	04-Jun-2020	03-Jun-2020	03-Jun-2020	12-Jun-2020	
			Asbest	os Lab:	COVENTRY	COVENTRY					
Determinand	Accred.	SOP	Units	LOD							
Toluene	М	2760	µg/kg	1.0	< 1.0	< 1.0					
Trans-1,3-Dichloropropene	N	2760	µg/kg	10	< 10	< 10					
1,1,2-Trichloroethane	М	2760	µg/kg	10	< 10	< 10					
Tetrachloroethene	М	2760	µg/kg	1.0	< 1.0	< 1.0					
1,3-Dichloropropane	U	2760	µg/kg	2.0	< 2.0	< 2.0					
Dibromochloromethane	U	2760	µg/kg	10	< 10	< 10					
1,2-Dibromoethane	М	2760	µg/kg	5.0	< 5.0	< 5.0					
Chlorobenzene	М	2760	µg/kg	1.0	< 1.0	< 1.0					
1,1,1,2-Tetrachloroethane	М	2760	µg/kg	2.0	< 2.0	< 2.0					
Ethylbenzene	М	2760	µg/kg	1.0	< 1.0	< 1.0					
m & p-Xylene	М	2760	µg/kg	1.0	< 1.0	< 1.0					
o-Xylene	М	2760	µg/kg	1.0	< 1.0	< 1.0					
Styrene	М	2760	µg/kg	1.0	< 1.0	< 1.0					
Tribromomethane	U	2760	µg/kg	1.0	< 1.0	< 1.0					
Isopropylbenzene	М	2760	µg/kg	1.0	< 1.0	< 1.0					
Bromobenzene	М	2760	µg/kg	1.0	< 1.0	< 1.0					
1,2,3-Trichloropropane	N	2760	µg/kg	50	< 50	< 50					
N-Propylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0					
2-Chlorotoluene	М	2760	µg/kg	1.0	< 1.0	< 1.0					
1,3,5-Trimethylbenzene	М	2760	µg/kg	1.0	< 1.0	< 1.0					
4-Chlorotoluene	U	2760	µg/kg	1.0	< 1.0	< 1.0					
Tert-Butylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0					
1,2,4-Trimethylbenzene	М	2760	µg/kg	1.0	< 1.0	< 1.0					
Sec-Butylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0					
1,3-Dichlorobenzene	М	2760	µg/kg	1.0	< 1.0	< 1.0					
4-Isopropyltoluene	U	2760	µg/kg	1.0	< 1.0	< 1.0					
1,4-Dichlorobenzene	М	2760	µg/kg	1.0	< 1.0	< 1.0					
N-Butylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0					
1,2-Dichlorobenzene	М	2760	µg/kg	1.0	< 1.0	< 1.0					
1,2-Dibromo-3-Chloropropane	U	2760	µg/kg	50	< 50	< 50					
1,2,4-Trichlorobenzene	М	2760	µg/kg	1.0	< 1.0	< 1.0					
Hexachlorobutadiene	U	2760	µg/kg	1.0	< 1.0	< 1.0					
1,2,3-Trichlorobenzene	U	2760	µg/kg	2.0	< 2.0	< 2.0					
Methyl Tert-Butyl Ether	М	2760	µg/kg	1.0	< 1.0	< 1.0					
N-Nitrosodimethylamine	М	2790		0.50	< 0.50	< 0.50					
Phenol	M	2790	mg/kg	0.50	< 0.50	< 0.50					
2-Chlorophenol	M	2790	mg/kg	0.50	< 0.50	< 0.50					
Bis-(2-Chloroethyl)Ether	M		mg/kg	0.50	< 0.50	< 0.50					

The right chemistry to deliver results Project: Q0269 Llantarnam 3G Pitch

Results - Soil

Client: Quantum Geotechnic Ltd			mtest Jo		20-14402	20-14402	20-14402	20-14402	20-14402	20-14402
Quotation No.: Q20-20396	0	Chemtest Sample ID.:			1014479	1014480	1014482	1014487	1014492	1017768
Order No.:		Client Sample Ref.:		1	1	2	1	2	1	
		Sa	ample Lo		HP17	HP03	HP05	HP01	HP18	HP05
				e Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Dep		0.4	0.4	0.8	0.5	1.0	0.3
			Date Sa	-	04-Jun-2020	03-Jun-2020	04-Jun-2020	03-Jun-2020	03-Jun-2020	12-Jun-2020
			Asbest		COVENTRY	COVENTRY				
Determinand	Accred.	SOP	Units							
1,3-Dichlorobenzene	М	2790	0 0	0.50	< 0.50	< 0.50				
1,4-Dichlorobenzene	N	2790	mg/kg	0.50	< 0.50	< 0.50				
1,2-Dichlorobenzene	М	2790	mg/kg	0.50	< 0.50	< 0.50				
2-Methylphenol	М	2790	mg/kg	0.50	< 0.50	< 0.50				
Bis(2-Chloroisopropyl)Ether	М	2790		0.50	< 0.50	< 0.50				
Hexachloroethane	N	2790	mg/kg	0.50	< 0.50	< 0.50				
N-Nitrosodi-n-propylamine	М	2790	mg/kg	0.50	< 0.50	< 0.50				
4-Methylphenol	М	2790	mg/kg	0.50	< 0.50	< 0.50				
Nitrobenzene	М	2790	00	0.50	< 0.50	< 0.50				
Isophorone	М	2790	00	0.50	< 0.50	< 0.50				
2-Nitrophenol	N	2790	mg/kg	0.50	< 0.50	< 0.50				
2,4-Dimethylphenol	N	2790	mg/kg	0.50	< 0.50	< 0.50				
Bis(2-Chloroethoxy)Methane	М	2790	mg/kg	0.50	< 0.50	< 0.50				
2,4-Dichlorophenol	М	2790	mg/kg	0.50	< 0.50	< 0.50				
1,2,4-Trichlorobenzene	М	2790	mg/kg	0.50	< 0.50	< 0.50				
Naphthalene	М	2790	mg/kg	0.50	< 0.50	< 0.50				
4-Chloroaniline	N	2790	mg/kg	0.50	< 0.50	< 0.50				
Hexachlorobutadiene	М	2790	mg/kg	0.50	< 0.50	< 0.50				
4-Chloro-3-Methylphenol	М	2790	mg/kg	0.50	< 0.50	< 0.50				
2-Methylnaphthalene	М	2790	mg/kg	0.50	< 0.50	< 0.50				
4-Nitrophenol	N	2790	mg/kg	0.50	< 0.50	< 0.50				
Hexachlorocyclopentadiene	N	2790	mg/kg	0.50	< 0.50	< 0.50				
2,4,6-Trichlorophenol	М	2790	mg/kg	0.50	< 0.50	< 0.50				
2,4,5-Trichlorophenol	М	2790	mg/kg	0.50	< 0.50	< 0.50				
2-Chloronaphthalene	М	2790		0.50	< 0.50	< 0.50				
2-Nitroaniline	М	2790	mg/kg	0.50	< 0.50	< 0.50				
Acenaphthylene	М	2790	00	0.50	< 0.50	< 0.50				
Dimethylphthalate	М	2790	mg/kg	0.50	< 0.50	< 0.50				
2,6-Dinitrotoluene	M	2790	mg/kg	0.50	< 0.50	< 0.50				
Acenaphthene	М	2790	mg/kg	0.50	< 0.50	< 0.50				
3-Nitroaniline	Ν	2790		0.50	< 0.50	< 0.50				
Dibenzofuran	М	2790		0.50	< 0.50	< 0.50				
4-Chlorophenylphenylether	M	2790	mg/kg	0.50	< 0.50	< 0.50				
2,4-Dinitrotoluene	М	2790		0.50	< 0.50	< 0.50				
Fluorene	М	2790	mg/kg	0.50	< 0.50	< 0.50				
Diethyl Phthalate	М	2790	mg/kg	0.50	< 0.50	< 0.50				
4-Nitroaniline	М	2790	mg/kg	0.50	< 0.50	< 0.50				
2-Methyl-4,6-Dinitrophenol	N	2790	mg/kg	0.50	< 0.50	< 0.50				

The right chemistry to deliver results Project: Q0269 Llantarnam 3G Pitch

Results - Soil

Client: Quantum Geotechnic Ltd		Che	mtest Jo	ob No.:	20-14402	20-14402	20-14402	20-14402	20-14402	20-14402
Quotation No.: Q20-20396	(Chemtest Sample ID.:			1014479	1014480	1014482	1014487	1014492	1017768
Order No.:			nt Samp		1	1	2	1	2	1
		Sa	ample Lo		HP17	HP03	HP05	HP01	HP18	HP05
				е Туре:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Тор Dep	oth (m):	0.4	0.4	0.8	0.5	1.0	0.3
			Date Sa	ampled:	04-Jun-2020	03-Jun-2020	04-Jun-2020	03-Jun-2020	03-Jun-2020	12-Jun-2020
			Asbest	os Lab:	COVENTRY	COVENTRY				
Determinand	Accred.	SOP	Units	LOD						
Azobenzene	М	2790	mg/kg	0.50	< 0.50	< 0.50				
4-Bromophenylphenyl Ether	М	2790	mg/kg	0.50	< 0.50	< 0.50				
Hexachlorobenzene	М	2790	mg/kg	0.50	< 0.50	< 0.50				
Pentachlorophenol	N	2790	mg/kg	0.50	< 0.50	< 0.50				
Phenanthrene	М	2790	mg/kg	0.50	< 0.50	< 0.50				
Anthracene	М	2790	mg/kg	0.50	< 0.50	< 0.50				
Carbazole	М	2790	mg/kg	0.50	< 0.50	< 0.50				
Di-N-Butyl Phthalate	М	2790	mg/kg	0.50	< 0.50	< 0.50				
Fluoranthene	М	2790	mg/kg	0.50	< 0.50	< 0.50				
Pyrene	М	2790	mg/kg	0.50	< 0.50	< 0.50				
Butylbenzyl Phthalate	М	2790	mg/kg	0.50	< 0.50	< 0.50				
Benzo[a]anthracene	М	2790	mg/kg	0.50	< 0.50	< 0.50				
Chrysene	М	2790	mg/kg	0.50	< 0.50	< 0.50				
Bis(2-Ethylhexyl)Phthalate	Ν	2790	mg/kg	0.50	< 0.50	< 0.50				
Di-N-Octyl Phthalate	М	2790	mg/kg	0.50	< 0.50	< 0.50				
Benzo[b]fluoranthene	М	2790	mg/kg	0.50	< 0.50	< 0.50				
Benzo[k]fluoranthene	М	2790	mg/kg	0.50	< 0.50	< 0.50				
Benzo[a]pyrene	М	2790	mg/kg	0.50	< 0.50	< 0.50				
Indeno(1,2,3-c,d)Pyrene	М	2790	mg/kg	0.50	< 0.50	< 0.50				
Dibenz(a,h)Anthracene	М	2790	mg/kg	0.50	< 0.50	< 0.50				
Benzo[g,h,i]perylene	М	2790	mg/kg	0.50	< 0.50	< 0.50				
Total Phenols	М	2920	mg/kg	0.30	< 0.30	< 0.30				



Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	рН	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2175	Total Sulphur in Soils	Total Sulphur	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2325	Sulphide in Soils	Sulphide	Steam distillation with sulphuric acid / analysis by 'Aquakem 600' Discrete Analyser, using N,N–dimethyl-p-phenylenediamine.
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3- band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2790	Semi-Volatile Organic Compounds (SVOCs) in Soils by GC-MS	Semi-volatile organic compounds(cf. USEPA Method 8270)	Acetone/Hexane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1- Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.



Report Information

Key

- U UKAS accredited
- M MCERTS and UKAS accredited
- N Unaccredited
- S This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
- SN This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
- T This analysis has been subcontracted to an unaccredited laboratory
- I/S Insufficient Sample
- U/S Unsuitable Sample
- N/E not evaluated
- < "less than"
- > "greater than"

Comments or interpretations are beyond the scope of UKAS accreditation The results relate only to the items tested Uncertainty of measurement for the determinands tested are available upon request None of the results in this report have been recovery corrected All results are expressed on a dry weight basis The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols For all other tests the samples were dried at < 37°C prior to analysis All Asbestos testing is performed at the indicated laboratory Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

- A Date of sampling not supplied
- B Sample age exceeds stability time (sampling to extraction)
- C Sample not received in appropriate containers
- D Broken Container
- E Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt All water samples will be retained for 14 days from the date of receipt Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com



APPENDIX IX – GEOTECHNICAL LABORATORY TEST RESULTS









Qtv

Contract Number: 48912

Client Ref: Q0269 Client PO:

Report Date: 03-07-2020

Client Quantum Geotechnic Ltd Ty Berwig Bynea Llanelli. Carmarthenshire. **SA14 9ST**

Contract Title: Llantarnam 3G Pitch For the attention of: Arwel Jones

Date Received: 12-06-2020 Date Completed: 03-07-2020

Test Description

	Qty
Moisture Content BS 1377:1990 - Part 2 : 3.2 - * UKAS	5
4 Point Liquid & Plastic Limit	5
BS 1377:1990 - Part 2 : 4.3 & 5.3 - * UKAS	
PSD Wet Sieve method	1
BS 1377:1990 - Part 2 : 9.2 - * UKAS	
PSD: Sedimentation by pipette carried out with Wet Sieve (Wet Sieve must also be selected) BS 1377:1990 - Part 2 : 9.4 - * UKAS	1
Disposal of samples for job	1

Notes: Observations and Interpretations are outside the UKAS Accreditation

- * denotes test included in laboratory scope of accreditation
- # denotes test carried out by approved contractor
- @ denotes non accredited tests

This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory. Approved Signatories:

Emma Sharp (Office Manager) - Paul Evans (Quality/Technical Manager) - Richard John (Advanced Testing Manager) Sean Penn (Administrative/Accounts Assistant) - Shaun Jones (Laboratory manager) - Wayne Honey (Administrative/Quality Assistant)

GEO Site & Testing Services Ltd Unit 3-4, Heol Aur, Dafen Ind Estate, Dafen, Llanelli, Carmarthenshire SA14 8QN Tel: 01554 784040 Fax: 01554 784041 info@gstl.co.uk gstl.co.uk



NATURAL MOISTURE, LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX (BS 1377 : Part 2 : 1990 Method 5)

Contract Number

Site Name

Date Tested

48912

Llantarnam 3G Pitch

23/06/2020

DESCRIPTIONS

Sample/Hole Reference	Sample Number	Sample Type	Depth (m)		n)	Descriptions
HP02	1	В	0.80	-	1.00	Brown fine sandy silty CLAY.
HP04	1	В	0.60	-	0.80	Brown fine to coarse gravelly sandy silty CLAY.
HP15	1	D	1.00	-	1.00	Brown fine sandy silty CLAY.
HP18	1	D	1.00	-		Brown fine to coarse gravelly sandy silty CLAY.
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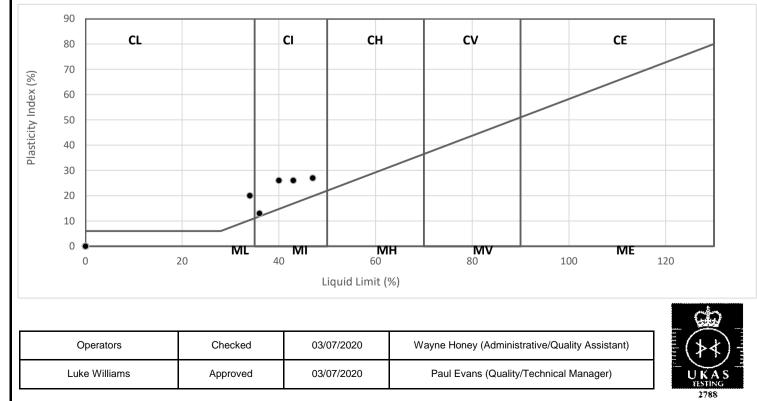


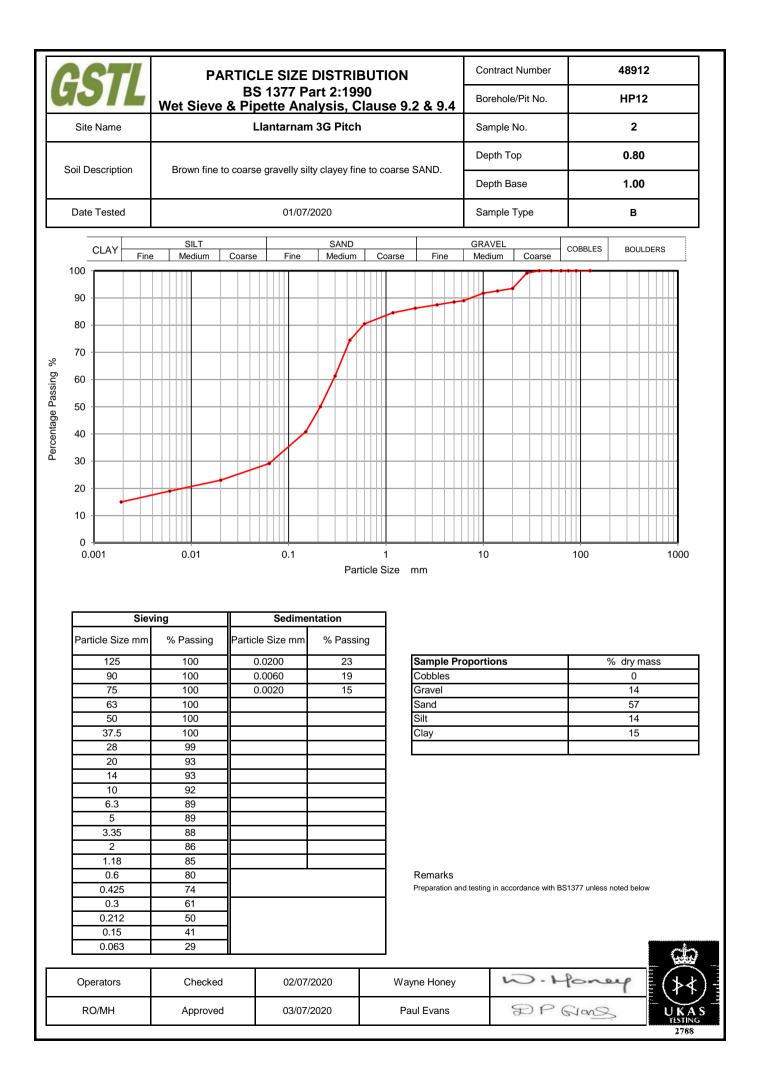
Operators	Checked	03/07/2020	Wayne Honey (Administrative/Quality Assistant)
Luke Williams	Approved	03/07/2020	Paul Evans (Quality/Technical Manager)

GSTL	NATURAL MOISTURE, LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX (BS 1377 : Part 2 : 1990 Method 5)	
Contract Number	48912	
Project Location	Llantarnam 3G Pitch	
Date Tested	23/06/2020	

Sample/Hole Reference	Sample Number	Sample Type	Depth (m)			Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity index %	Passing 0.425mm %	Remarks
HP02	1	В	0.80	-	1.00	18	47	20	27	100	CI Intermediate Plasticity
HP04	1	В	0.60	-	0.80	15	43	17	26	80	CI Intermediate Plasticity
HP12	2	В	0.80	-	1.00	11	40	14	26	74	CI Intermediate Plasticity
HP15	1	D	1.00	-	1.00	23	36	23	13	100	CI Intermediate Plasticity
HP18	1	D	1.00	-		14	34	14	20	90	CL Low Plasticity
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PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION BS 5930:1999+A2:2010









Contract Number: 49046

Client Ref: **Q0269** Client PO:

Laboratory Report

Report Date: 17-07-2020

Client Quantum Geotechnic Ltd Ty Berwig Bynea Llanelli. Carmarthenshire. SA14 9ST

Contract Title: Llantarnam 3G Pitch For the attention of: Jim Dennis

Date Received: 24-06-2020 Date Completed: 17-07-2020

Test Description Qty **Moisture Content** 10 BS 1377:1990 - Part 2 : 3.2 - * UKAS 10 **4 Point Liquid & Plastic Limit** BS 1377:1990 - Part 2 : 4.3 & 5.3 - * UKAS **PSD Wet Sieve method** 4 BS 1377:1990 - Part 2 : 9.2 - * UKAS PSD: Sedimentation by pipette carried out with Wet Sieve (Wet Sieve must also be selected) 4 BS 1377:1990 - Part 2 : 9.4 - * UKAS Dry Den/MC (2.5kg Rammer Method CBR Mould) 2 BS 1377:1990 - Part 4 : 3.4 - * UKAS CBR at each Compaction point (5 Points) excludes compaction test 2 BS 1377:1990 - Part 4 : 7 - * UKAS Disposal of samples for job 1 Notes: Observations and Interpretations are outside the UKAS Accreditation * - denotes test included in laboratory scope of accreditation # - denotes test carried out by approved contractor @ - denotes non accredited tests

This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory. Approved Signatories:

Emma Sharp (Office Manager) - Paul Evans (Quality/Technical Manager) - Richard John (Advanced Testing Manager) Sean Penn (Administrative/Accounts Assistant) - Shaun Jones (Laboratory manager) - Wayne Honey (Administrative/Quality Assistant)

GEO Site & Testing Services Ltd Unit 3-4, Heol Aur, Dafen Ind Estate, Dafen, Llanelli, Carmarthenshire SA14 8QN Tel: 01554 784040 Fax: 01554 784041 info@gstl.co.uk gstl.co.uk

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NATURAL MOISTURE, LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX

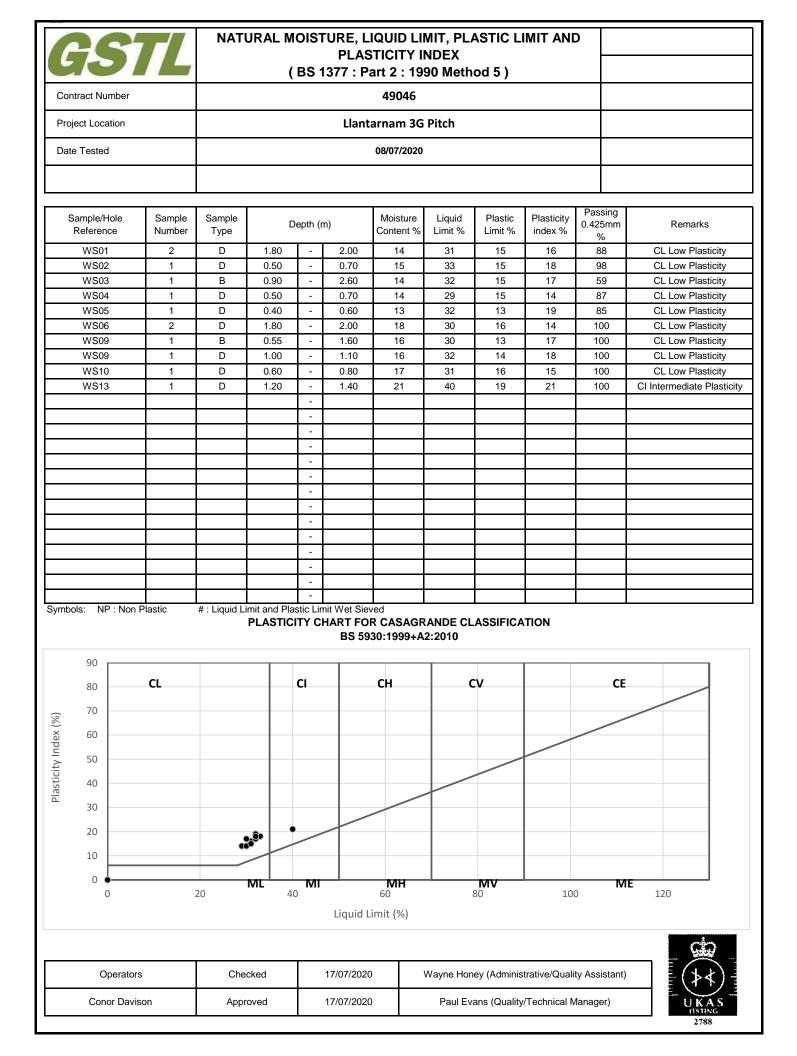
(BS 1377 : Part 2 : 1990 Method 5)

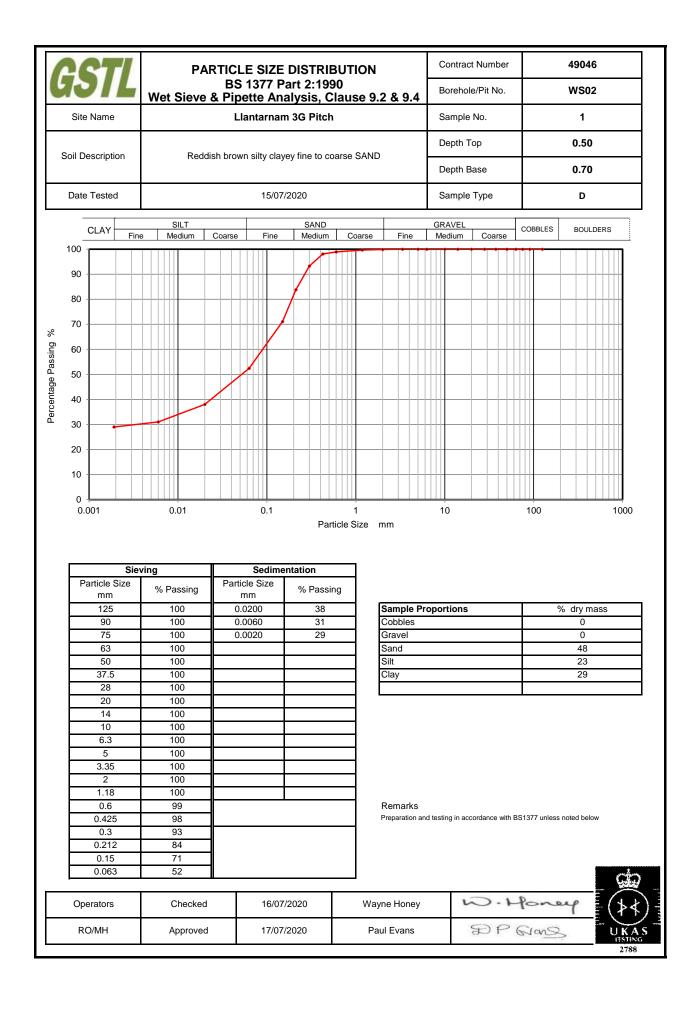
Contract Number	49046	
Site Name	Llantarnam 3G Pitch	
Date Tested	08/07/2020	
	DESCRIPTIONS	

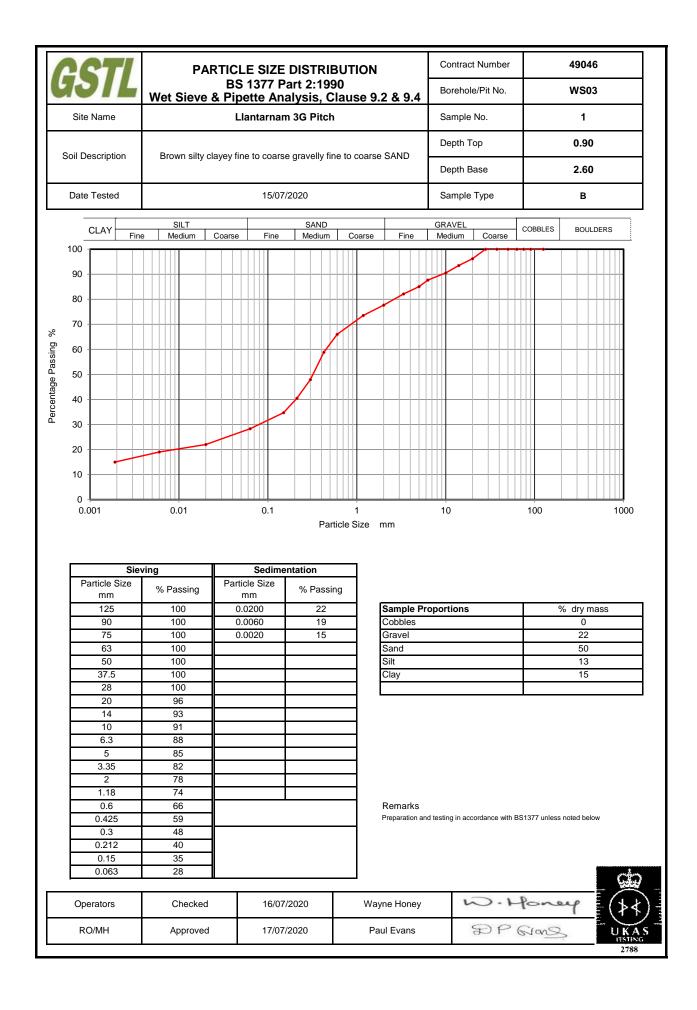
Sample/Hole Reference	Sample Number	Sample Type	Depth (m)		n)	Descriptions
WS01	2	D	1.80	-	2.00	Reddish greyish brown fine to medium gravelly sandy silty CLAY
WS02	1	D	0.50	-	0.70	Reddish brown silty clayey fine to coarse SAND
WS03	1	В	0.90	-	2.60	Brown silty clayey fine to coarse gravelly fine to coarse SAND
WS04	1	D	0.50	-	0.70	Reddish brown fine to medium gravelly silty sandy CLAY
WS05	1	D	0.40	-	0.60	Reddish brown fine to coarse gravelly silty sandy CLAY
WS06	2	D	1.80	-	2.00	Reddish brown silty sandy CLAY
WS09	1	В	0.55	-	1.60	Reddish brown silty CLAY
WS09	1	D	1.00	-	1.10	Reddish brown silty CLAY
WS10	1	D	0.60	-	0.80	Reddish brown silty CLAY
WS13	1	D	1.20	-	1.40	Reddish brown silty CLAY
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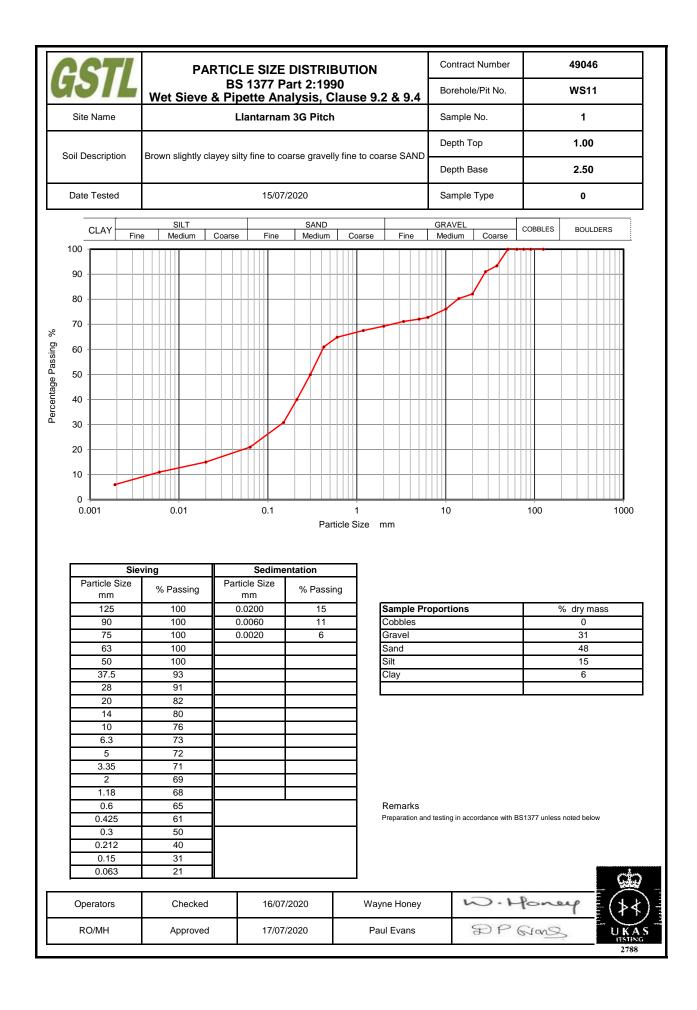
2788	

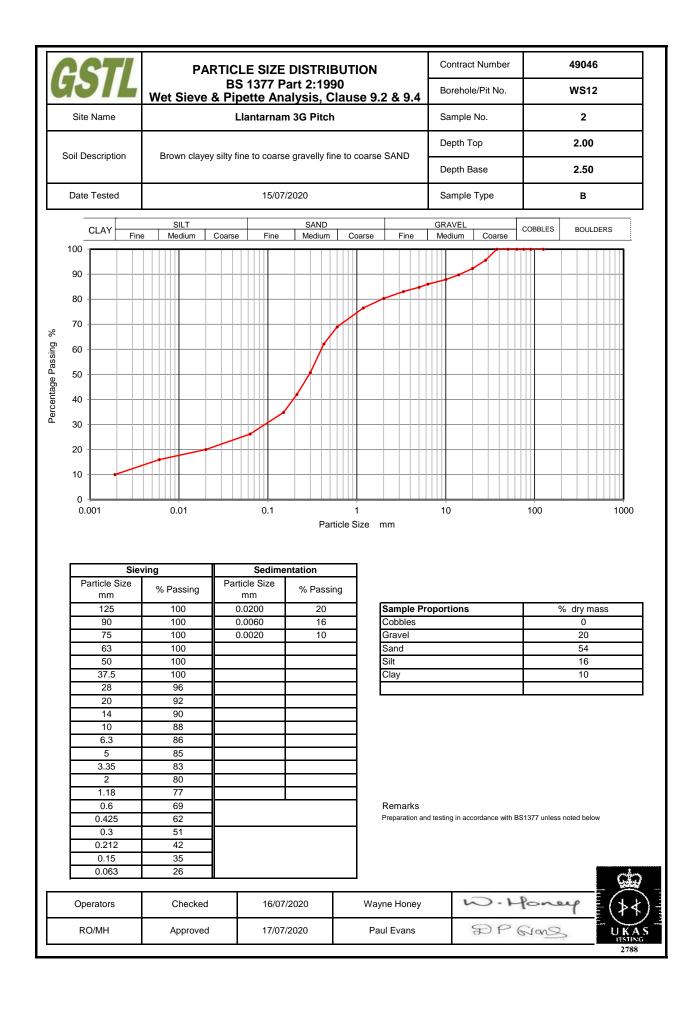
Operators	Checked	17/07/2020	Wayne Honey (Administrative/Quality Assistant)				
Conor Davison	Approved	17/07/2020	Paul Evans (Quality/Technical Manager)				





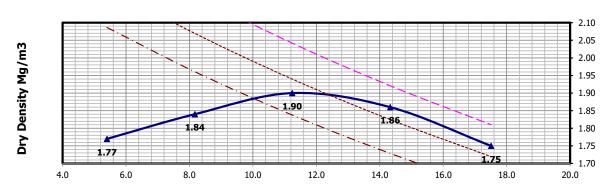


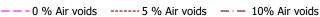


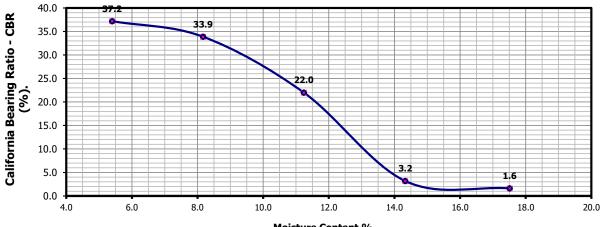


California Bearing Ratio/Dry Density Moisture Content Relationship BS 1377:Part 4:1990

Client ref:	Q0269
Location:	Llantarnam 3G Pitch
Contract Number:	49046
Hole Number:	HDTP3
Sample Number:	1
Depth (m) : from	0.60
Depth (m) : to	0.80
Sample Type	В







Moisture Content %.

Moisture Content	5.4	8.2	11.2	14.3	17.5		
CBR Value Top	37.2	33.9	22.0	3.2	1.6		
CBR Value Bot							
Mean CBR Value	37	34	22	3	2		
Dry Density	1.77	1.84	1.90	1.86	1.75		
Initial Sample Conditions:		Method of C	Compaction 2.5 KG	Rammer			
Initial Moisture Content (%):				11.2	Single samp	le Tested	
Material Retained on the 37.5m	nm BS Sieve (%	%):		0	Maximum D	ry Density (Mg/m ³)	1.90
Material Retained on the 20.0m	nm BS Sieve (%	%):		5	Optimum M	oisture Content (%	11
Particle Density (Mg/m ³) :		Assum	ed	2.65			





17/07/2020 Date

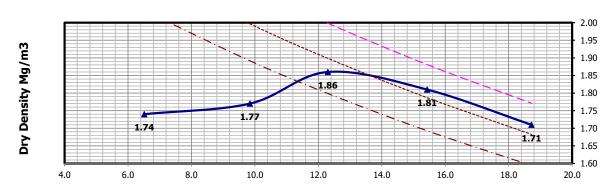
17/07/2020 Approved by Date

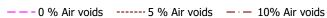


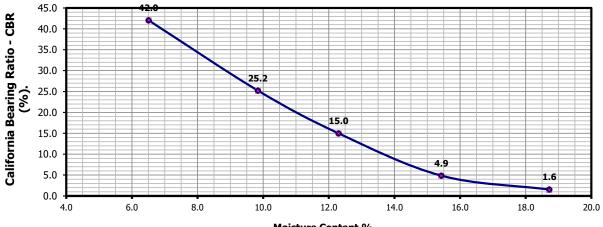
Contract No.: 49046 **Client Ref No:** Q0269

California Bearing Ratio/Dry Density Moisture Content Relationship BS 1377:Part 4:1990

Client ref:	Q0269
Location:	Llantarnam 3G Pitch
Contract Number:	49046
Hole Number:	HDTP5
Sample Number:	1
Depth (m) : from	0.60
Depth (m) : to	0.80
Sample Type	В







Moisture	Content	%.
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Moisture Content	6.5	9.8	12.3	15.4	18.7		
CBR Value Top	42.0	25.2	15.0	4.9	1.5		
CBR Value Bot							
Mean CBR Value	42	25	15	5	2		
Dry Density	1.74	1.77	1.86	1.81	1.71		
Initial Sample Conditions:	Initial Sample Conditions:						
Initial Moisture Content (%):				15.4	Single samp	le Tested	
Material Retained on the 37.5m	nm BS Sieve (%	%):		21	Maximum D	ry Density (Mg/m ³)	1.86
Material Retained on the 20.0m	nm BS Sieve (%	%):		4	Optimum M	oisture Content (%	12
Particle Density (Mg/m ³) :		Assum	led	2.65			





17/07/2020 Date





-

Contract No.: 49046 Client Ref No: Q0269



SA4 0FQ T: 01554 744880 E: enquiries@quantumgeotech.co.uk W: http://www.quantumgeotech.co.uk

Quantum Geotechnic Ltd

Plas Newydd Pontardulais Swansea





APPENDIX B

Appendix B GQRA Results

We | Listen Create Deliver

CAPITA Leachate Screening Results

			Sample ID	WS02	WS08	WS10				
AC values chosen from minimum value of	EU EWS. WFD		Sample Desc	0.3	0.2	0.2				
2015, and WHO DWQ standards		Date Sampled	05/06/2020	05/06/2020	05/06/2020					
Analyte:	Method Code:	AC	Units:			•		•		
Arsenic as As (Dissolved)	ICPMSW	0.0075	mg/l	< 1.0	< 1.0	< 1.0				
Cadmium as Cd (Dissolved)	ICPMSW	0.003	mg/l	< 0.080	< 0.080	< 0.080				
Chromium as Cr (Dissolved)	ICPMSW	0.0375	mg/l							
Copper as Cu (Dissolved)	ICPMSW	1.5	mg/l	3.9	2.1	< 1.0				
Lead as Pb (Dissolved)	ICPMSW	0.0075	mg/l	1.5	1.6	< 1.0				
Mercury as Hg (Dissolved)	ICPMSW	0.00075	mg/l	< 0.50	< 0.50	< 0.50				
Nickel as Ni (Dissolved)	ICPMSW	0.015	mg/l	< 1.0	< 1.0	< 1.0				
Selenium as Se (Dissolved)	ICPMSW	0.0075	mg/l	3.6	< 1.0	< 1.0				
Zinc as Zn (Dissolved)	ICPMSW		mg/l							
Boron as B (Dissolved) a	ICPWATVAR	0.75	mg/l	< 20	< 20	< 20				
Antimony as Sb (Dissolved)	ICPMSW	0.02	mg/l							
Molybdenum as Mo (Dissolved)	ICPMSW	0.7	mg/l							
Barium as Ba (Dissolved) a	ICPWATVAR		mg/l							
· · ·										
Total Sulphur as SO4 (Dissolved) a	ICPWATVAR		mg/l							
Fluoride as F a	ISEF	1.13	mg/l							
Chloride as Cl w	KONENS	188	mg/l							
Acenaphthene	PAHMSW		ug/l							
Acenaphthylene	PAHMSW		ug/l							
Anthracene	PAHMSW		ug/l							
Benzo(a)anthracene	PAHMSW		ug/l							
Benzo(b)fluoranthene	PAHMSW	0.075	ug/l							
Benzo(ghi)perylene	PAHMSW		ug/l							
Benzo(k)fluoranthene	PAHMSW		ug/l							
Benzo-a-Pyrene	PAHMSW	0.0075	ug/l	< 0.10	< 0.10	< 0.10				
Chrysene	PAHMSW		ug/l							
Dibenzo(a,h)anthracene	PAHMSW		ug/l							
Fluoranthene	PAHMSW	0.075	ug/l							
Fluorene	PAHMSW		ug/l							
Indeno(1,2,3-cd)pyrene	PAHMSW		ug/l							
Naphthalene	PAHMSW	0.075	ug/l							
Phenanthrene	PAHMSW		ug/l							
Pyrene	PAHMSW		ug/l							
Total PAH (Sum of USEPA 16)	PAHMSW	40	ug/l							
Phenol Index as C6H5OH	SFAPI		mg/l							
Dissolved Organic Carbon w	WSLM13		mg/l		1		1			
Conductivity uS/cm @ 25C w	WSLM13	2500	uS/cm		1		1			
Total Dissolved Solids	WSLM27	2000	mg/l		 		<u> </u>			
Total Dissolved Solids w	WSLM27		mg/l		 		<u> </u>			
pH units w	WSLM28		pH units							
	WOLINIJ	I		I				I	I	I



Note Note Note Note No				Tanja D	10933	4105	W106	V0.64	1010	1017	1953	HPGS	HPQ1	1911	1004		_			_				
	GAC value based on minimum AC v	alue d	Xar Cuit	ngie Desil Tamped	0100/2020	028	0.65	05/06/2020	01000000	0000/2020	0.4 E3/06/2020	0.8 64/98/2020	23.06 2020	02/06/2020	33									
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	a Xolena Nilizana	17220-0A	1 0089	5	20	00	a a	1	р. С	0	0	4	9	9	50		_			_				
	1/0/145	17220-04	18700	5																				
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	190-OLCT ANALIS	ORCHOR		noke																				
	CENTER AND AND A STREET	ORCHOR		note																				
	ALL ALL ALL ALL ALL ALL ALL ALL ALL ALL	#1535GA		1994																				
	1PID (CE-CTE Allahalis) 2D4- takat sat	STACKS	-	note																				
Dist Dist <thdist< th=""> Dist Dist <thd< td=""><td>Table OFT THE OW</td><td>1000</td><td>44700</td><td>-</td><td>4.00</td><td></td><td>0.02</td><td>6.83</td><td></td><td></td><td></td><td>_</td><td>_</td><td>_</td><td></td><td>_</td><td>_</td><td>_</td><td>_</td><td>_</td><td>r</td><td>_</td><td>]</td><td></td></thd<></thdist<>	Table OFT THE OW	1000	44700	-	4.00		0.02	6.83				_	_	_		_	_	_	_	_	r	_]	
Dist Dist <thdist< th=""> Dist Dist <thd< td=""><td>Anania (ME)</td><td>27521</td><td>170</td><td>right</td><td>11</td><td>10 A.V.</td><td>10 0.74</td><td>13</td><td>74</td><td>82 4 10</td><td>44</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></thd<></thdist<>	Anania (ME)	27521	170	right	11	10 A.V.	10 0.74	13	74	82 4 10	44													
	Chromos (MII)	1075/03	8833	note	22	2	25	32	22	22	72													
	Load (MIC)	109503	1300	note	28	2	22	21	9	-	я													
	Denary (MS) Name (MS)	109441	358	ricks	< 0.10	×0.10 28	< 6.10	28	<0.10	25	×6.10 21													
Control Contro <thcontrol< th=""> <thcontrol< th=""> <thco< td=""><td>Selector ME</td><td>109503</td><td>1800</td><td>1075</td><td>0.55</td><td>231</td><td>031</td><td>671</td><td>638</td><td>244</td><td>0.13</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></thco<></thcontrol<></thcontrol<>	Selector ME	109503	1800	1075	0.55	231	031	671	638	244	0.13													
Section Section <t< td=""><td>Chomers vi.</td><td>KONECE</td><td>32</td><td>note</td><td><0.80</td><td>1030</td><td>< 0.02</td><td><0.92</td><td><0.80</td><td>10.00</td><td>10.50</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>	Chomers vi.	KONECE	32	note	<0.80	1030	< 0.02	<0.92	<0.80	10.00	10.50													
Section Section <t< td=""><td>.01 % # 480C</td><td>CONTRACT I</td><td></td><td>5</td><td></td><td></td><td>1</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>1</td><td></td><td></td><td></td></t<>	.01 % # 480C	CONTRACT I		5			1														1			
Section Section <t< td=""><td>Nanash Duna</td><td>PR-00L3</td><td>29000</td><td>note</td><td>10.10</td><td>1010</td><td>< 0.12</td><td>< 0.12</td><td>< 0.10</td><td>3.1</td><td>0.81</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>	Nanash Duna	PR-00L3	29000	note	10.10	1010	< 0.12	< 0.12	< 0.10	3.1	0.81													
Section Section <t< td=""><td>Anthracene Senados setúnacene</td><td>PR-001-2</td><td>180000</td><td>note</td><td>10.10</td><td>1010</td><td><pre><0.10 < 0.10</pre></td><td><0.10</td><td>10.10</td><td>2.66</td><td>0.88</td><td>-</td><td></td><td></td><td></td><td></td><td>-</td><td></td><td></td><td>-</td><td></td><td></td><td></td><td></td></t<>	Anthracene Senados setúnacene	PR-001-2	180000	note	10.10	1010	<pre><0.10 < 0.10</pre>	<0.10	10.10	2.66	0.88	-					-			-				
Section Section <t< td=""><td>Service and the service of the servi</td><td>PRODUCT.</td><td>- 15</td><td>nuke</td><td>10.10</td><td>1010</td><td><0.10</td><td><0.52</td><td><0.50</td><td>40</td><td>21</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>	Service and the service of the servi	PRODUCT.	- 15	nuke	10.10	1010	<0.10	<0.52	<0.50	40	21													
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	*C8 183 *C8 180	PONICE		100																				
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	19H Ag Band XC12 C18	1796,030	3800																					
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	e and a Xolena	VOORME	-	1000																				
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	food Organic Carbon	1075-M08	1 - I	1.94	_				_	_		_		_	_		_		_	_				_



		S	ample ID	WS01	WS15
CWAC values chosen from minimu			ple Desc	1.38	1.81
EWS, WFD 2015, and WHO DWQ	standards	Date	Sampled	15/06/2020	15/06/2020
Analyte:	Method Code:	CWAC	Units:		
Benzene	BTEXHSA	0.75	ug/l	<1	<1
Ethyl Benzene	BTEXHSA	300	ug/l	<1	<1
m/p Xylenes	BTEXHSA		ug/l		
o Xylene Toluene	BTEXHSA BTEXHSA	700	ug/l	<1	<1
Xylenes	BTEXHSA	700	ug/l ug/l	~1	
Ammonia (Free) as N calc a	FNH3CALC		mg/l		
GRO >C5->C6 GRO >C5->C6 Aliphatic	GROHSA GROHSA		mg/l mg/l		+
GRO >C6->C7	GROHSA		mg/l		
GRO >C6->C7 Aliphatic	GROHSA		mg/l		
GRO >C7->C8	GROHSA		mg/l		
GRO >C7->C8 Aliphatic	GROHSA		mg/l		
GRO >C8->C10	GROHSA		mg/l		
GRO >C8->C10 Aliphatic GRO-HSA o	GROHSA		mg/l		
	GROHSA	I	mg/l		
Arsenic as As (Dissolved)	ICPMSW	0.0075	mg/l	< 1.0	3.8
Cadmium as Cd (Dissolved)	ICPMSW	0.003	mg/l	< 0.080	< 0.080
Chromium as Cr (Dissolved)	ICPMSW ICPMSW	0.0375	mg/l	3.5	< 1.0
Copper as Cu (Dissolved) Lead as Pb (Dissolved)	ICPMSW	0.0075	mg/l mg/l	<u>1.9</u> < 1.0	< 1.0 < 1.0
Mercury as Hg (Dissolved)	ICPMSW	0.00075	mg/l	< 0.50	< 0.50
Nickel as Ni (Dissolved)	ICPMSW	0.015	mg/l	3.9	6.3
Zinc as Zn (Dissolved)	ICPMSW		mg/l		
Boron as B (Dissolved) a	ICPWATVAR	0.075	mg/l	24	< 20
Calcium as Ca (Dissolved) a	ICPWATVAR		mg/l		
Magnesium as Mg (Dissolved) a	ICPWATVAR		mg/l		
Ammoniacal Nitrogen as N	KONENS	0.29	mg/l		
Chloride as Cl w	KONENS	188	mg/l		
Nitrate as N	KONENS	37.5	mg/l		
Acenaphthene	PAHMSW		ug/l		
Acenaphthylene	PAHMSW		ug/l		
Anthracene	PAHMSW		ug/l		
Benzo(a)anthracene	PAHMSW	0.075	ug/l		
Benzo(b)fluoranthene Benzo(ghi)perylene	PAHMSW PAHMSW	0.075	ug/l ug/l		-
Benzo(k)fluoranthene	PAHMSW		ug/l		
Benzo-a-Pyrene	PAHMSW	0.0075	ug/l		
Chrysene	PAHMSW		ug/l		
Dibenzo(a,h)anthracene	PAHMSW		ug/l		
Fluoranthene	PAHMSW	0.075	ug/l		
Fluorene	PAHMSW		ug/l		
Indeno(1,2,3-cd)pyrene Naphthalene	PAHMSW PAHMSW	0.075	ug/l ug/l		
Phenanthrene	PAHMSW	0.070	ug/l		1
Pyrene	PAHMSW		ug/l		
Total PAH (Sum of USEPA 16)	PAHMSW	40	ug/l		
Cyanide (Free) as CN	SFAPI		mg/l		
TPH Ali Band >C10-C12	TPHFID-Si		mg/l		
TPH Ali Band >C12-C16	TPHFID-Si	1	mg/l		
TPH Ali Band >C16-C21	TPHFID-Si		mg/l		
TPH Ali Band >C21-C35	TPHFID-Si		mg/l		
TPH Ali Band >C8-C10	TPHFID-Si		mg/l		
TPH Ali Band >C8-C40 TPH Aro Band >C10-C12	TPHFID-Si TPHFID-Si		mg/l		
TPH Aro Band >C10-C12 TPH Aro Band >C12-C16	TPHFID-SI TPHFID-Si	1	mg/l mg/l		
TPH Aro Band >C12-C10 TPH Aro Band >C16-C21	TPHFID-Si		mg/l		
TPH Aro Band >C21-C35	TPHFID-Si		mg/l		
TPH Aro Band >C8-C10	TPHFID-Si		mg/l		
TPH Aro Band >C8-C40	TPHFID-Si		mg/l		
Total Alkalinity as CaCO3 w	WSLM12		mg/l		
Dissolved Organic Carbon w	WSLM13	0500	mg/l		
Conductivity uS/cm @ 25C w pH units w	WSLM2 WSLM3	2500	uS/cm pH units		
pri drins w	VVOLIVIO	I	pri units		I



APPENDIX C

Appendix C Waste Classification Data

We | Listen Create Deliver

Waste Classification Report



Job name			
Llantarnam 3G Pitch			
Description/Comme	ents		
Project			
Llantarnam 3G Pitch			
Site			
Llantarnam 3G Pitch			
Related Documents	5		
# Name	Descrip	otion	
None			
Waste Stream Temp	plate		
Example waste stream ter	mplate for contaminated soils		
Classified by			
Name: Liam Bailey Date: 09 Sep 2020 13:30 GMT	Company: Capita Property and Infrasturcture Ltd (Wales) St David's House	HazWasteOnline™ Training Record: Course Hazardous Waste Classification	Date

Report

Telephone:

02920803500

Created by: Liam Bailey Created date: 09 Sep 2020 13:30 GMT

Pascal Close, St Mellons

Cardiff CF3 0LW

Job summary

#	Sample Name	Depth [m]	Classification Result	Hazard properties	Page
1	WS02	0.3	Non Hazardous		3
2	WS05	0.0	Non Hazardous		6
3	WS06	0.15	Non Hazardous		9
4	WS08	0.2	Non Hazardous		12
5	WS10	0.2	Non Hazardous		15
6	HP17	0.4	Non Hazardous		18
7	HP03	0.4	Non Hazardous		21
8	HP05	0.8	Non Hazardous		24
9	HP01	0.5	Non Hazardous		25
10	HP18	1.0	Non Hazardous		26
11	HP05[2]	0.3	Non Hazardous		27

Advanced Hazardous Waste Classification

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Appendices

Appendices	Page
Appendix A: Classifier defined and non CLP determinands	28
Appendix B: Rationale for selection of metal species	29
Appendix C: Version	30



Classification of sample: WS02



Sample details

LoW Code	
Chapter:	17: Construction and Demolition Wastes (including excavated soi
	from contaminated sites)
Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05
	03)

Hazard properties

None identified

Determinands

Moisture content: 15% No Moisture Correction applied (MC)

#		Determinand CLP index number EC Number CAS Numb	er	CLP Note	User entered	l data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	4	arsenic { arsenic trioxide }			11	mg/kg	1.32	14.524 mg/kg	0.00145 %		
2	4	beryllium { beryllium oxide } 004-003-00-8 215-133-1 1304-56-9			1	mg/kg	2.775	2.775 mg/kg	0.000278 %		
3	4	boron { diboron trioxide; boric oxide } 005-008-00-8 215-125-8 1303-86-2			0.59	mg/kg	3.22	1.9 mg/kg	0.00019 %		
4	4	cadmium { cadmium oxide } 048-002-00-0 215-146-2 1306-19-0			0.25	mg/kg	1.142	0.286 mg/kg	0.0000286 %		
5	4	chromium in chromium(III) compounds { Chromium oxide (worst case) } 215-160-9 1308-38-9	(111)		20	mg/kg	1.462	29.231 mg/kg	0.00292 %		
6	4	chromium in chromium(VI) compounds {	I)		0.5	mg/kg	1.923	0.962 mg/kg	0.0000962 %		
7	4	024-001-00-0 215-607-8 1333-82-0 copper { dicopper oxide; copper (I) oxide } 029-002-00-X 215-270-7 1317-39-1			24	mg/kg	1.126	27.021 mg/kg	0.0027 %		
8	4	029-002-00-X 215-270-7 1317-39-1 mercury { mercury dichloride } 080-010-00-X 231-299-8 7487-94-7			0.1	mg/kg	1.353	0.135 mg/kg	0.0000135 %		
9	4	nickel { nickel chromate } 028-035-00-7 238-766-5 14721-18-7			22	mg/kg	2.976	65.478 mg/kg	0.00655 %		
10	4	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewh in this Annex } 034-002-00-8			0.58	mg/kg	2.554	1.481 mg/kg	0.000148 %		
11	4	zinc { zinc chromate } 024-007-00-3 236-878-9 13530-65-9			110	mg/kg	2.774	305.156 mg/kg	0.0305 %		
12	8	TPH (C6 to C40) petroleum group			10	mg/kg		10 mg/kg	0.001 %		
13		benzene 601-020-00-8 200-753-7 71-43-2			0.001	mg/kg		0.001 mg/kg	0.0000001 %		
14		toluene 601-021-00-3 203-625-9 108-88-3			0.001	mg/kg		0.001 mg/kg	0.0000001 %		



#		Dete	erminand		CLP Note	User entered	d data	Conv. Factor	Compound	conc.	Classification value	MC Applied	Conc. Not Used
		CLP index number EC	Number	CAS Number	CLP			. doto.			, and	MC /	0000
15		ethylbenzene 601-023-00-4 202-849	9-4	100-41-4		0.001	mg/kg		0.001	mg/kg	0.0000001 %		
16		xylene 601-022-00-9 202-42; 203-39(203-57(215-53)	2-2 [1] 6-5 [2] 6-3 [3]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		0.001	mg/kg		0.001	mg/kg	0.0000001 %		
17	4	cyanides { salts of hydro exception of complex cyan ferricyanides and mercuric specified elsewhere in this 006-007-00-5	ides such a oxycyanide	s ferrocyanides,		0.5	mg/kg	1.884	0.942	mg/kg	0.0000942 %		
18	۵	pH		PH		6.9	pН		6.9	pН	6.9 pH		
19		naphthalene				0.1	mg/kg		0.1	mg/kg	0.00001 %		
20	0	601-052-00-2 202-04 acenaphthylene 205-91		91-20-3 208-96-8		0.1	mg/kg		0.1	mg/kg	0.00001 %		
21	0	acenaphthene 201-469		83-32-9		0.1	mg/kg		0.1	mg/kg	0.00001 %		
22	۵	fluorene 201-69		86-73-7		0.1	mg/kg		0.1	mg/kg	0.00001 %		
23	۵	phenanthrene 201-58		85-01-8		0.1	mg/kg		0.1	mg/kg	0.00001 %	Ì	
24	۲	anthracene 204-37	1-1	120-12-7		0.1	mg/kg		0.1	mg/kg	0.00001 %		
25	0	fluoranthene 205-912	2-4	206-44-0	-	0.1	mg/kg		0.1	mg/kg	0.00001 %		
26	۲	pyrene 204-92	7-3	129-00-0		0.1	mg/kg		0.1	mg/kg	0.00001 %		
27		benzo[a]anthracene 601-033-00-9 200-280	0-6	56-55-3		0.1	mg/kg		0.1	mg/kg	0.00001 %		
28		chrysene 601-048-00-0 205-923	3-4	218-01-9		0.1	mg/kg		0.1	mg/kg	0.00001 %		
29		benzo[b]fluoranthene 601-034-00-4 205-91	1-9	205-99-2		0.1	mg/kg		0.1	mg/kg	0.00001 %		
30		benzo[k]fluoranthene 601-036-00-5 205-910		207-08-9		0.1	mg/kg		0.1	mg/kg	0.00001 %		
31		benzo[a]pyrene; benzo[def 601-032-00-3 200-028		50-32-8		0.1	mg/kg		0.1	mg/kg	0.00001 %		
32	۲	indeno[123-cd]pyrene 205-893	3-2	193-39-5		0.1	mg/kg		0.1	mg/kg	0.00001 %		
33		dibenz[a,h]anthracene 601-041-00-2 200-18	1-8	53-70-3		0.1	mg/kg		0.1	mg/kg	0.00001 %		
34		benzo[ghi]perylene 205-883	3-8	191-24-2		0.1	mg/kg		0.1	mg/kg	0.00001 %		
35		phenol 604-001-00-2 203-632		108-95-2		0.5	mg/kg		0.5	mg/kg	0.00005 %		
36		carbon tetrachloride; tetrac 602-008-00-5 200-262	2-8	ne 56-23-5		0.001	mg/kg		0.001	mg/kg	0.0000001 %		
37		vinyl chloride; chloroethyle 602-023-00-7 200-83		75-01-4		0.001	mg/kg		0.001	mg/kg	0.0000001 %		
										Total:	0.0462 %		

Key

User supplied data

Determinand defined or amended by HazWasteOnline (see Appendix A)

Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration



Supplementary Hazardous Property Information

HP 2: Oxidizing "waste which may, generally by providing oxygen, cause or contribute to the combustion of other materials" Force this Hazardous property to non hazardous because At limit of detection.

Hazard Statements hit:

Ox. Sol. 1; H271 "May cause fire or explosion; strong oxidiser."

Because of determinand:

chromium(VI) oxide: (compound conc.: 0.00009%)

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because At limit of detection.

Hazard Statements hit:

Flam. Liq. 2; H225 "Highly flammable liquid and vapour."

Because of determinands: benzene: (conc.: 1.0e-07%) toluene: (conc.: 1.0e-07%) ethylbenzene: (conc.: 1.0e-07%)

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinands:

TPH (C6 to C40) petroleum group: (conc.: 0.001%) xylene: (conc.: 1.0e-07%)

<u>HP 3(iv): Flammable</u> "flammable gaseous waste: gaseous waste which is flammable in air at 20°C and a standard pressure of 101.3 kPa"

Force this Hazardous property to non hazardous because At limit of detection.

Hazard Statements hit:

Flam. Gas 1; H220 "Extremely flammable gas."

Because of determinand:

vinyl chloride; chloroethylene: (conc.: 1.0e-07%)



Classification of sample: WS05

Non Hazardous Waste	
Classified as 17 05 04	
in the List of Waste	

Sample details

WS05 Ch Sample Depth:	bW Code: 17: Construction and Demolition Wastes (including excavated soin from contaminated sites) ntry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
--------------------------	--

Hazard properties

None identified

Determinands

Moisture content: 15% No Moisture Correction applied (MC)

#		CLP index number	Determinand EC Number	CAS Number	CLP Note	User entered	d data	Conv. Factor	Compound o	conc.	Classification value	MC Applied	Conc. Not Used
1		arsenic { arsenic tric	<mark>oxide</mark> } 215-481-4	1327-53-3		12	mg/kg	1.32	15.844	mg/kg	0.00158 %		
2	-4	beryllium {		1304-56-9		1	mg/kg	2.775	2.775	mg/kg	0.000278 %		
3		boron { diboron triox 005-008-00-8	xide; boric oxide } 215-125-8	1303-86-2		0.7	mg/kg	3.22	2.254	mg/kg	0.000225 %		
4	4	cadmium { cadmiun 048-002-00-0	<mark>n oxide</mark> } 215-146-2	1306-19-0		0.32	mg/kg	1.142	0.366	mg/kg	0.0000366 %		
5	4	chromium in chromi oxide (worst case) }	· · · ·	\$ { • <mark>chromium(III)</mark> 1308-38-9	_	25	mg/kg	1.462	36.539	mg/kg	0.00365 %		
6	4	chromium in chromi <mark>oxide</mark> }	ium(VI) compounds	s {		0.5	mg/kg	1.923	0.962	mg/kg	0.0000962 %		
7	4	copper { dicopper o	215-607-8 <mark>xide; copper (I) oxi</mark> 215-270-7	1333-82-0 <mark>de</mark> } 1317-39-1		28	mg/kg	1.126	31.525	mg/kg	0.00315 %		
8	-	mercury { mercury o		7487-94-7		0.1	mg/kg	1.353	0.135	mg/kg	0.0000135 %		
9	-	nickel { <mark>nickel chron</mark>		14721-18-7		25	mg/kg	2.976	74.407	mg/kg	0.00744 %		
10	~	selenium { selenium cadmium sulphosele in this Annex 034-002-00-8				0.51	mg/kg	2.554	1.302	mg/kg	0.00013 %		
11		zinc { zinc chromate 024-007-00-3	<mark>9</mark> } 236-878-9	13530-65-9		120	mg/kg	2.774	332.898	mg/kg	0.0333 %		
12	0	TPH (C6 to C40) pe	etroleum group	ТРН		10	mg/kg		10	mg/kg	0.001 %		
13		benzene 601-020-00-8	200-753-7	71-43-2		0.001	mg/kg		0.001	mg/kg	0.0000001 %		
14		toluene 601-021-00-3	203-625-9	108-88-3		0.001	mg/kg		0.001	mg/kg	0.0000001 %		



#		Determinand	N Actor		User entered	data	Conv. Factor	Compound c	onc.	Classification value	MC Applied	Conc. Not Used
		CLP index number EC Number	CAS Number	2							MC.	
15		ethylbenzene			0.001	mg/kg		0.001	mg/kg	0.0000001 %		
		601-023-00-4 202-849-4 1	00-41-4									
16		203-396-5 [2] 1 203-576-3 [3] 1	5-47-6 [1] 06-42-3 [2] 08-38-3 [3] 330-20-7 [4]		0.001	mg/kg		0.001	mg/kg	0.0000001 %		
17	4	cyanides { salts of hydrogen cyanide exception of complex cyanides such as ferricyanides and mercuric oxycyanide a specified elsewhere in this Annex }	ferrocyanides,		0.5	mg/kg	1.884	0.942	mg/kg	0.0000942 %		
_		006-007-00-5 pH		_								
18	8		°Н		7.3	pН		7.3	pН	7.3 pH		
19		naphthalene			0.1	mg/kg		0.1	mg/kg	0.00001 %		
		601-052-00-2 202-049-5 9	1-20-3		0.1	mg/kg		0.1	ing/kg			
20	9	acenaphthylene 205-917-1 2	208-96-8		0.1	mg/kg		0.1	mg/kg	0.00001 %		
21	0	acenaphthene	2 22 0		0.1	mg/kg		0.1	mg/kg	0.00001 %		
	0	201-469-6 8 fluorene	3-32-9									
22			86-73-7		0.1	mg/kg		0.1	mg/kg	0.00001 %		
23	0	phenanthrene 201-581-5 8	35-01-8		0.1	mg/kg		0.1	mg/kg	0.00001 %		
24		anthracene			0.1	mg/kg		0.1	mg/kg	0.00001 %		
			20-12-7									
25	8	fluoranthene 205-912-4 2	206-44-0		0.1	mg/kg		0.1	mg/kg	0.00001 %		
26	0	pyrene	29-00-0		0.1	mg/kg		0.1	mg/kg	0.00001 %		
27		benzo[a]anthracene			0.1	mg/kg		0.1	mg/kg	0.00001 %		
			6-55-3	_								
28		chrysene 601-048-00-0 205-923-4 2	18-01-9		0.1	mg/kg		0.1	mg/kg	0.00001 %		
		benzo[b]fluoranthene	.10 01 3	_								
29			205-99-2		0.1	mg/kg		0.1	mg/kg	0.00001 %		
30		benzo[k]fluoranthene			0.1	mg/kg		0.1	mg/kg	0.00001 %		
Ľ			207-08-9			9.49			3.1.9			
31		benzo[a]pyrene; benzo[def]chrysene 601-032-00-3 200-028-5 5	60-32-8		0.1	mg/kg		0.1	mg/kg	0.00001 %		
32	8	indeno[123-cd]pyrene	02.20.5		0.1	mg/kg		0.1	mg/kg	0.00001 %		
		205-893-2 1 dibenz[a,h]anthracene	93-39-5		0.4	m m //		0.1		0.00004.00	\square	
33			3-70-3		0.1	mg/kg		0.1	mg/kg	0.00001 %		
34	0	benzo[ghi]perylene	01.24.2		0.1	mg/kg		0.1	mg/kg	0.00001 %		
35		205-883-8 1 phenol	91-24-2		0.5	ma/ler		0.5	mallia	0.00005.9/	\square	
35		604-001-00-2 203-632-7 1	08-95-2		0.5	mg/kg		0.5	mg/kg	0.00005 %		
36		carbon tetrachloride; tetrachloromethan 602-008-00-5 200-262-8 5	e i6-23-5		0.001	mg/kg		0.001	mg/kg	0.0000001 %		
37		vinyl chloride; chloroethylene			0.001	mg/kg		0.001	mg/kg	0.0000001 %		
		602-023-00-7 200-831-0 7	/5-01-4						Total:	0.0512 %	\vdash	
									iotal.	0.0012 70	1	

Key

4

User supplied data
 Determinand define

Determinand defined or amended by HazWasteOnline (see Appendix A)

Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration



Supplementary Hazardous Property Information

HP 2: Oxidizing "waste which may, generally by providing oxygen, cause or contribute to the combustion of other materials" Force this Hazardous property to non hazardous because At limit of detection.

Hazard Statements hit:

Ox. Sol. 1; H271 "May cause fire or explosion; strong oxidiser."

Because of determinand:

chromium(VI) oxide: (compound conc.: 0.00009%)

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because At limit of detection.

Hazard Statements hit:

Flam. Liq. 2; H225 "Highly flammable liquid and vapour."

Because of determinands: benzene: (conc.: 1.0e-07%) toluene: (conc.: 1.0e-07%) ethylbenzene: (conc.: 1.0e-07%)

Flam. Lig. 3; H226 "Flammable liquid and vapour."

Because of determinands:

TPH (C6 to C40) petroleum group: (conc.: 0.001%) xylene: (conc.: 1.0e-07%)

HP 3(iv): Flammable "flammable gaseous waste: gaseous waste which is flammable in air at 20°C and a standard pressure of 101.3 kPa"

Force this Hazardous property to non hazardous because At limit of detection.

Hazard Statements hit:

Flam. Gas 1; H220 "Extremely flammable gas."

Because of determinand:

vinyl chloride; chloroethylene: (conc.: 1.0e-07%)



Classification of sample: WS06



Sample details

Sample Name: WS06 Sample Depth: 0.15 m Moisture content:	LoW Code: Chapter: Entry:	17: Construction and Demolition Wastes (including excavated so from contaminated sites) 17 05 04 (Soil and stones other than those mentioned in 17 05
Moisture content: 6.4% (no correction)		03)

Hazard properties

None identified

Determinands

Moisture content: 6.4% No Moisture Correction applied (MC)

#		CLP index number EC Number	CAS Number	CLP Note	User entered	d data	Conv. Factor	Compound	conc.	Classification value	MC Applied	Conc. Not Used
1	-	arsenic { arsenic trioxide }	1		12	mg/kg	1.32	15.844	mg/kg	0.00158 %		
2		033-003-00-0 215-481-4 beryllium { beryllium oxide }	1327-53-3		5.5		0 775	15.264		0.00450.0/	\square	
2	-	004-003-00-8 215-133-1	1304-56-9		5.5	тід/кд	2.775	15.204	mg/kg	0.00153 %		
3	4	boron { <mark>diboron trioxide; boric oxide</mark> }			0.83	mg/kg	3.22	2.672	mg/kg	0.000267 %		
Ŭ		005-008-00-8 215-125-8	1303-86-2				0.22					
4	4	cadmium { <mark>cadmium oxide</mark> }			0.28	ma/ka	1.142	0.32	mg/kg	0.000032 %		
Ľ		048-002-00-0 215-146-2	1306-19-0		0.20			0.02		0.000002 //		
5	4	chromium in chromium(III) compounds <mark>oxide (worst case)</mark> }			25	mg/kg	1.462	36.539	mg/kg	0.00365 %		
		215-160-9	1308-38-9									
6	~	chromium in chromium(VI) compounds oxide }	•		0.5	mg/kg	1.923	0.962	mg/kg	0.0000962 %		
		024-001-00-0 215-607-8	1333-82-0									
7	4	copper { dicopper oxide; copper (I) oxi			22	mg/kg	1.126	24.77	mg/kg	0.00248 %		
		029-002-00-X 215-270-7	1317-39-1									
8	-	mercury { mercury dichloride }			0.1	mg/kg	1.353	0.135	mg/kg	0.0000135 %		
		080-010-00-X 231-299-8	7487-94-7									
9 🖣	-	nickel { nickel chromate }			25	mg/kg	2.976	74.407	mg/kg	0.00744 %		
		028-035-00-7 238-766-5	14721-18-7									
10		selenium { selenium compounds with t cadmium sulphoselenide and those sp in this Annex } 034-002-00-8			0.81	mg/kg	2.554	2.068	mg/kg	0.000207 %		
	-										-	
11	-	zinc { zinc chromate } 024-007-00-3	13530-65-9		78	mg/kg	2.774	216.383	mg/kg	0.0216 %		
12	0	TPH (C6 to C40) petroleum group			10	mg/kg		10	mg/kg	0.001 %		
			ТРН									
13		benzene 601-020-00-8 200-753-7	71-43-2		0.001	mg/kg		0.001	mg/kg	0.0000001 %		
\vdash	_	toluene	11-43-2	-							+	
14		toluene 601-021-00-3 203-625-9	108-88-3		0.001	mg/kg		0.001	mg/kg	0.0000001 %		



≤ ett 5 • ett 60 • • 60 • • 7 ≪ cy 8 cy • 9 • •	thylbenzene 01-023-00-4 202-849-4 100 ylene 203-396-5 [2] 106 01-022-00-9 202-422-2 [1] 95-4 203-396-5 [2] 106 203-576-3 [3] 108 215-535-7 [4] 133 yanides { salts of hydrogen cyanide wit xception of complex cyanides such as ferrericyanides and mercuric oxycyanide and pecified elsewhere in this Annex } 36-007-00-5 H	rocyanides,	0.001	mg/kg mg/kg	Factor	0.001	mg/kg mg/kg	value 0.0000001 %	MC Applied	Used
5 6 00 6 20 7 4 20 7 50 000 000	D1-023-00-4 202-849-4 100 ylene 01-022-00-9 202-422-2 [1] 95-4 203-396-5 [2] 106 203-576-3 [3] 108 215-535-7 [4] 133 yanides { salts of hydrogen cyanide wit xception of complex cyanides such as ferroricyanides and mercuric oxycyanide and pecified elsewhere in this Annex } 36-007-00-5 16-007-00-5	0-41-4 47-6 [1] 6-42-3 [2] 8-38-3 [3] 80-20-7 [4] th the rocyanides,	0.001							
6 Since Sin	ylene 01-022-00-9 202-422-2 [1] 95-4 203-396-5 [2] 106 203-576-3 [3] 108 215-535-7 [4] 133 yanides { salts of hydrogen cyanide with xception of complex cyanides such as ferri- perified elsewhere in this Annex } 06-007-00-5 H	47-6 [1] -42-3 [2] -38-3 [3] -20-7 [4] th the rocyanides,		mg/kg		0.001	mg/kg	0.0000001 %		
7 fei sp	xception of complex cyanides such as fer pricyanides and mercuric oxycyanide and pecified elsewhere in this Annex } 16-007-00-5	rocyanides,	0.5							
- nH	Н		0.0	mg/kg	1.884	0.942	mg/kg	0.0000942 %		
	PH		7	pН		7	рН	7pH		
9	aphthalene	20-3	0.1	mg/kg		0.1	mg/kg	0.00001 %		
	cenaphthylene	3-96-8	0.1	mg/kg		0.1	mg/kg	0.00001 %		
1 ac	cenaphthene	32-9	0.1	mg/kg		0.1	mg/kg	0.00001 %		
2 🕛 flu	uorene	73-7	0.1	mg/kg		0.1	mg/kg	0.00001 %		
:3 • ph	henanthrene	01-8	0.1	mg/kg		0.1	mg/kg	0.00001 %		
24 • ar	nthracene 204-371-1 120)-12-7	0.1	mg/kg		0.1	mg/kg	0.00001 %		
25 a flu	uoranthene 205-912-4 206	5-44-0	0.1	mg/kg		0.1	mg/kg	0.00001 %		
26 • py	vrene 204-927-3 129	9-00-0	0.1	mg/kg		0.1	mg/kg	0.00001 %		
	enzo[a]anthracene)1-033-00-9 200-280-6 56-{	55-3	0.1	mg/kg		0.1	mg/kg	0.00001 %		
.8	hrysene)1-048-00-0 205-923-4 218	8-01-9	0.1	mg/kg		0.1	mg/kg	0.00001 %		
60		j-99-2	0.1	mg/kg		0.1	mg/kg	0.00001 %		
60		7-08-9	0.1	mg/kg		0.1	mg/kg	0.00001 %		
60		32-8	0.1	mg/kg		0.1	mg/kg	0.00001 %		
		3-39-5	0.1	mg/kg		0.1	mg/kg	0.00001 %		
60		70-3	0.1	mg/kg		0.1	mg/kg	0.00001 %		
64		-24-2	0.1	mg/kg		0.1	mg/kg	0.00001 %		
60		3-95-2	0.5	mg/kg		0.5	mg/kg	0.00005 %		
60		23-5	0.001	mg/kg		0.001	mg/kg	0.0000001 %		
	inyl chloride; chloroethylene)2-023-00-7 200-831-0 75-0	01-4	0.001	mg/kg		0.001	mg/kg Total:	0.0000001 %		

Key

User supplied data

Determinand defined or amended by HazWasteOnline (see Appendix A)

Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration



Supplementary Hazardous Property Information

HP 2: Oxidizing "waste which may, generally by providing oxygen, cause or contribute to the combustion of other materials" Force this Hazardous property to non hazardous because At limit of detection.

Hazard Statements hit:

Ox. Sol. 1; H271 "May cause fire or explosion; strong oxidiser."

Because of determinand:

chromium(VI) oxide: (compound conc.: 0.00009%)

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because At limit of detection.

Hazard Statements hit:

Flam. Liq. 2; H225 "Highly flammable liquid and vapour."

Because of determinands: benzene: (conc.: 1.0e-07%) toluene: (conc.: 1.0e-07%) ethylbenzene: (conc.: 1.0e-07%)

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinands:

TPH (C6 to C40) petroleum group: (conc.: 0.001%) xylene: (conc.: 1.0e-07%)

<u>HP 3(iv): Flammable</u> "flammable gaseous waste: gaseous waste which is flammable in air at 20°C and a standard pressure of 101.3 kPa"

Force this Hazardous property to non hazardous because At limit of detection.

Hazard Statements hit:

Flam. Gas 1; H220 "Extremely flammable gas."

Because of determinand:

vinyl chloride; chloroethylene: (conc.: 1.0e-07%)



Classification of sample: WS08

1	
	Non Hazardous Waste
	Classified as 17 05 04
	in the List of Waste
1	

Sample details

Sample Name: WS08 Sample Depth:		17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.2 m	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05
Moisture content:		03)
13% (no correction)		

Hazard properties

None identified

Determinands

Moisture content: 13% No Moisture Correction applied (MC)

#		Determinand CLP index number EC Number CAS Number			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		arsenic { arsenic tri 033-003-00-0	<mark>oxide</mark>	1327-53-3		12	mg/kg	1.32	15.844	mg/kg	0.00158 %		
2	-4	beryllium { berylliun		1304-56-9		1.7	mg/kg	2.775	4.718	mg/kg	0.000472 %		
3		boron { diboron trio	xide; boric oxide } 215-125-8	1303-86-2		0.51	mg/kg	3.22	1.642	mg/kg	0.000164 %		
4	~	cadmium { cadmium oxide } 048-002-00-0 215-146-2 1306-19-0				0.32	mg/kg	1.142	0.366	mg/kg	0.0000366 %		
5	4	chromium in chrom oxide (worst case)	}			32	mg/kg	1.462	46.77	mg/kg	0.00468 %		
6	4	chromium in chrom <mark>oxide</mark> }				0.5	mg/kg	1.923	0.962	mg/kg	0.0000962 %		
7	4	copper { dicopper o				21	mg/kg	1.126	23.644	mg/kg	0.00236 %		
8						0.1	mg/kg	1.353	0.135	mg/kg	0.0000135 %		
9	-	080-010-00-X 231-299-8 7487-94-7 nickel { nickel chromate } 028-035-00-7 238-766-5 14721-18-7				28	mg/kg	2.976	83.335	mg/kg	0.00833 %		
10	4	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				0.71	mg/kg	2.554	1.813	mg/kg	0.000181 %		
11		zinc { zinc chromate 024-007-00-3	e } 236-878-9	13530-65-9		110	mg/kg	2.774	305.156	mg/kg	0.0305 %		
12		TPH (C6 to C40) petroleum group				10	mg/kg		10	mg/kg	0.001 %		
13		benzene 601-020-00-8	200-753-7	71-43-2		0.001	mg/kg		0.001	mg/kg	0.0000001 %		
14		toluene 601-021-00-3	203-625-9	108-88-3		0.001	mg/kg		0.001	mg/kg	0.0000001 %		

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#		CLP index number EC Number CAS Number		CLP Note	User entered d	ata	Conv. Factor	Compound o	onc.	Classification value	MC Applied	Conc. Not Used
		CLP index number EC Number	CAS Number	CLP							AC.	
15	8	ethylbenzene	-	_	0.001 m	ng/kg		0.001	mg/kg	0.0000001 %		
10		601-023-00-4 202-849-4	100-41-4			ig/itg						
16		203-396-5 [2] 203-576-3 [3]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		0.001 m	ng/kg		0.001	mg/kg	0.0000001 %		
17	4	cyanides { salts of hydrogen cyanide exception of complex cyanides such as ferricyanides and mercuric oxycyanide specified elsewhere in this Annex } 006-007-00-5	ferrocyanides,		0.5 m	ng/kg	1.884	0.942	mg/kg	0.0000942 %		
18	8	рН			7.0			7.0		7.0 ml		
10			PH		7.2 p	н		7.2	рН	7.2 pH		
19		naphthalene			0.1 m	ng/kg		0.1	mg/kg	0.00001 %		
			91-20-3									
20	8	acenaphthylene 205-917-1	208-96-8		0.1 m	ng/kg		0.1	mg/kg	0.00001 %		
21	8	acenaphthene 201-469-6	83-32-9		0.1 m	ng/kg		0.1	mg/kg	0.00001 %		
22	8	fluorene			0.1 m	ng/kg		0.1	mg/kg	0.00001 %		
			86-73-7									
23	Θ	phenanthrene 201-581-5	85-01-8		0.1 m	ng/kg		0.1	mg/kg	0.00001 %		
24	Θ	anthracene			0.1 m	ng/kg		0.1	mg/kg	0.00001 %		
			120-12-7			0 0						
25	Θ	fluoranthene 205-912-4	206-44-0		0.1 m	ng/kg		0.1	mg/kg	0.00001 %		
26	8	pyrene	129-00-0		0.1 m	ng/kg		0.1	mg/kg	0.00001 %		
27		benzo[a]anthracene	56-55-3		0.1 m	ng/kg		0.1	mg/kg	0.00001 %		
-		chrysene		_	0.4			0.4		0.00001.0/		
28		601-048-00-0 205-923-4	218-01-9		0.1 m	ng/kg		0.1	mg/kg	0.00001 %		
29	_	benzo[b]fluoranthene			0.1 m	ng/kg		0.1	mg/kg	0.00001 %	$ \top$	
_			205-99-2			5 3						
30		benzo[k]fluoranthene 601-036-00-5 205-916-6	207-08-9		0.1 m	ng/kg		0.1	mg/kg	0.00001 %		
		benzo[a]pyrene; benzo[def]chrysene										
31			50-32-8		0.1 m	ng/kg		0.1	mg/kg	0.00001 %		
32	8	indeno[123-cd]pyrene	400.00.5		0.1 m	ng/kg		0.1	mg/kg	0.00001 %		
\mid		205-893-2 dibenz[a,h]anthracene	193-39-5	_								
33			53-70-3		0.1 m	ng/kg		0.1	mg/kg	0.00001 %		
34	8	benzo[ghi]perylene			0.1 m	ng/kg		0.1	mg/kg	0.00001 %		
			191-24-2	_							\square	
35		phenol 604-001-00-2 203-632-7	108-95-2		0.5 m	ng/kg		0.5	mg/kg	0.00005 %		
		carbon tetrachloride; tetrachloromethar		_	0.001			0.001		0.0000001.0/		
36			56-23-5		0.001 m	ng/kg		0.001	mg/kg	0.0000001 %		
37		vinyl chloride; chloroethylene 602-023-00-7 200-831-0	75-01-4		0.001 m	ng/kg		0.001	mg/kg	0.0000001 %		
			•						Total:	0.0497 %		

4

User supplied data

Determinand defined or amended by HazWasteOnline (see Appendix A)

Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration



HP 2: Oxidizing "waste which may, generally by providing oxygen, cause or contribute to the combustion of other materials" Force this Hazardous property to non hazardous because At limit of detection.

Hazard Statements hit:

Ox. Sol. 1; H271 "May cause fire or explosion; strong oxidiser."

Because of determinand:

chromium(VI) oxide: (compound conc.: 0.00009%)

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because At limit of detection.

Hazard Statements hit:

Flam. Liq. 2; H225 "Highly flammable liquid and vapour."

Because of determinands: benzene: (conc.: 1.0e-07%) toluene: (conc.: 1.0e-07%) ethylbenzene: (conc.: 1.0e-07%)

Flam. Lig. 3; H226 "Flammable liquid and vapour."

Because of determinands:

TPH (C6 to C40) petroleum group: (conc.: 0.001%) xylene: (conc.: 1.0e-07%)

HP 3(iv): Flammable "flammable gaseous waste: gaseous waste which is flammable in air at 20°C and a standard pressure of 101.3 kPa"

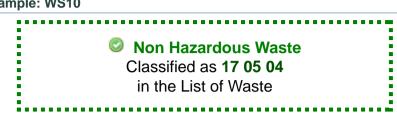
Force this Hazardous property to non hazardous because At limit of detection.

Hazard Statements hit:

Flam. Gas 1; H220 "Extremely flammable gas."

Because of determinand:





Sample details

Sample Name:	LoW Code:	
WS10	Chapter:	17: Construction and Demolition Wastes (including excavated soi
Sample Depth:		from contaminated sites)
0.2 m	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05
Moisture content:		03)
6.1%		
(no correction)		

Hazard properties

None identified

Determinands

Moisture content: 6.1% No Moisture Correction applied (MC)

#		Determinand CLP index number EC Number CAS Numb	er	CLP Note	User entered	l data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	4	arsenic { arsenic trioxide }			7.6	mg/kg	1.32	10.034 mg/kg	0.001 %		
2	4	beryllium { beryllium oxide } 004-003-00-8 215-133-1 1304-56-9			1.3	mg/kg	2.775	3.608 mg/kg	0.000361 %		
3	4	boron { diboron trioxide; boric oxide } 005-008-00-8 215-125-8 1303-86-2			0.4	mg/kg	3.22	1.288 mg/kg	0.000129 %		
4	4	cadmium { cadmium oxide } 048-002-00-0 215-146-2 1306-19-0			0.17	mg/kg	1.142	0.194 mg/kg	0.0000194 %		
5	4	chromium in chromium(III) compounds { Chromium oxide (worst case) } 215-160-9 1308-38-9	<mark>(III)</mark>		25	mg/kg	1.462	36.539 mg/kg	0.00365 %		
6	4	chromium in chromium(VI) compounds {)		0.5	mg/kg	1.923	0.962 mg/kg	0.0000962 %		
7	4	024-001-00-0 215-607-8 1333-82-0 copper { dicopper oxide; copper (I) oxide } 029-002-00-X 215-270-7 1317-39-1			17	mg/kg	1.126	19.14 mg/kg	0.00191 %		
8	4	mercury { mercury dichloride } 080-010-00-X 231-299-8 7487-94-7			0.1	mg/kg	1.353	0.135 mg/kg	0.0000135 %		
9	4	nickel { nickel chromate } 028-035-00-7 238-766-5 14721-18-7			26	mg/kg	2.976	77.383 mg/kg	0.00774 %		
10	4	selenium { selenium compounds with the exception o cadmium sulphoselenide and those specified elsewhe in this Annex } 034-002-00-8			0.35	mg/kg	2.554	0.894 mg/kg	0.0000894 %		
11		zinc { zinc chromate } 024-007-00-3 236-878-9 13530-65-9			63	mg/kg	2.774	174.771 mg/kg	0.0175 %		
12	0	TPH (C6 to C40) petroleum group			10	mg/kg		10 mg/kg	0.001 %		
13		benzene 601-020-00-8 200-753-7 71-43-2			0.001	mg/kg		0.001 mg/kg	0.0000001 %		
14		toluene 601-021-00-3 203-625-9 108-88-3			0.001	mg/kg		0.001 mg/kg	0.0000001 %		



#	Determinand CLP index number EC Number CAS Number		CLP Note	User entere	d data	Conv. Factor	Compound	conc.	Classification value	MC Applied	Conc. Not Used	
		CLP index number EC Number	er CAS Number	CLP			, actor			- and -	MC /	0000
15	8	ethylbenzene 601-023-00-4 202-849-4	100-41-4		0.001	mg/kg		0.001	mg/kg	0.0000001 %		
16		xylene 601-022-00-9 202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		0.001	mg/kg		0.001	mg/kg	0.0000001 %		
17		cyanides { salts of hydrogen cy exception of complex cyanides su ferricyanides and mercuric oxyce specified elsewhere in this Annex 006-007-00-5	ch as ferrocyanides, anide and those		0.5	mg/kg	1.884	0.942	mg/kg	0.0000942 %		
18	0	pH	PH		7.1	pН		7.1	pН	7.1 pH		
19		naphthalene 601-052-00-2 202-049-5	91-20-3	+	0.1	mg/kg		0.1	mg/kg	0.00001 %		
20	0	acenaphthylene 205-917-1	208-96-8		0.1	mg/kg		0.1	mg/kg	0.00001 %		
21	•	acenaphthene 201-469-6	83-32-9	+	0.1	mg/kg		0.1	mg/kg	0.00001 %		
22	0	fluorene 201-695-5	86-73-7		0.1	mg/kg		0.1	mg/kg	0.00001 %		
23	0	phenanthrene 201-581-5	85-01-8		0.1	mg/kg		0.1	mg/kg	0.00001 %	Ì	
24	8	anthracene 204-371-1	120-12-7		0.1	mg/kg		0.1	mg/kg	0.00001 %		
25	0	fluoranthene 205-912-4	206-44-0		0.1	mg/kg		0.1	mg/kg	0.00001 %		
26	0	pyrene 204-927-3	129-00-0		0.1	mg/kg		0.1	mg/kg	0.00001 %		
27		benzo[a]anthracene 601-033-00-9 200-280-6	56-55-3		0.1	mg/kg		0.1	mg/kg	0.00001 %		
28		chrysene 601-048-00-0 205-923-4	218-01-9		0.1	mg/kg		0.1	mg/kg	0.00001 %		
29	-	benzo[b]fluoranthene 601-034-00-4 205-911-9	205-99-2		0.1	mg/kg		0.1	mg/kg	0.00001 %		
30		benzo[k]fluoranthene 601-036-00-5 205-916-6	207-08-9	-	0.1	mg/kg		0.1	mg/kg	0.00001 %		
31		benzo[a]pyrene; benzo[def]chryse 601-032-00-3 200-028-5	50-32-8	-	0.1	mg/kg		0.1	mg/kg	0.00001 %		
32	•	indeno[123-cd]pyrene 205-893-2	193-39-5	-	0.1	mg/kg		0.1	mg/kg	0.00001 %		
33		dibenz[a,h]anthracene 601-041-00-2 200-181-8	53-70-3	-	0.1	mg/kg		0.1	mg/kg	0.00001 %		
34	0	benzo[ghi]perylene 205-883-8	191-24-2		0.1	mg/kg		0.1	mg/kg	0.00001 %		
35		phenol 604-001-00-2 203-632-7	108-95-2		0.5	mg/kg		0.5	mg/kg	0.00005 %		
36	-	carbon tetrachloride; tetrachlorom	56-23-5	-	0.001	mg/kg		0.001	mg/kg	0.0000001 %		
37	- 1	vinyl chloride; chloroethylene 602-023-00-7 200-831-0	75-01-4		0.001	mg/kg		0.001	mg/kg Total:	0.0000001 %		

User supplied data

Determinand defined or amended by HazWasteOnline (see Appendix A)

Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration



HP 2: Oxidizing "waste which may, generally by providing oxygen, cause or contribute to the combustion of other materials" Force this Hazardous property to non hazardous because At limit of detection.

Hazard Statements hit:

Ox. Sol. 1; H271 "May cause fire or explosion; strong oxidiser."

Because of determinand:

chromium(VI) oxide: (compound conc.: 0.00009%)

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because At limit of detection.

Hazard Statements hit:

Flam. Liq. 2; H225 "Highly flammable liquid and vapour."

Because of determinands: benzene: (conc.: 1.0e-07%) toluene: (conc.: 1.0e-07%) ethylbenzene: (conc.: 1.0e-07%)

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinands:

TPH (C6 to C40) petroleum group: (conc.: 0.001%) xylene: (conc.: 1.0e-07%)

<u>HP 3(iv): Flammable</u> "flammable gaseous waste: gaseous waste which is flammable in air at 20°C and a standard pressure of 101.3 kPa"

Force this Hazardous property to non hazardous because At limit of detection.

Hazard Statements hit:

Flam. Gas 1; H220 "Extremely flammable gas."

Because of determinand:



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Non Hazardous Waste Classified as 17 05 04 in the List of Waste

Sample details

Sample Name: HP17 Sample Depth: 0.4 m Moisture content: 10% no correction)	·	 17: Construction and Demolition Wastes (including excavated soil from contaminated sites) 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 10% No Moisture Correction applied (MC)

#		CLP index number	Determinand EC Number	CAS Number	CLP Note	User entered	d data	Conv. Factor	Compound c	onc.	Classification value	MC Applied	Conc. Not Used
1	~	arsenic { arsenic tri 033-003-00-0	<mark>ioxide</mark> } 215-481-4	1327-53-3		9.2	mg/kg	1.32	12.147	mg/kg	0.00121 %		
2		beryllium {		1304-56-9		1.4	mg/kg	2.775	3.885	mg/kg	0.000389 %		
3		boron { diboron trio 005-008-00-8	xide; boric oxide } 215-125-8	1303-86-2		0.42	mg/kg	3.22	1.352	mg/kg	0.000135 %		
4	4	cadmium { cadmiur 048-002-00-0	<mark>n oxide</mark> } 215-146-2	1306-19-0		0.21	mg/kg	1.142	0.24	mg/kg	0.000024 %		
5	4	chromium in chrom <mark>oxide (worst case)</mark>	}			25	mg/kg	1.462	36.539	mg/kg	0.00365 %		
6	4	chromium in chrom <mark>oxide</mark> }				0.5	mg/kg	1.923	0.962	mg/kg	0.0000962 %		
7		copper { <mark>dicopper c</mark>	215-607-8 <mark>xide; copper (I) oxi</mark> 215-270-7	1333-82-0 <mark>de</mark> } 1317-39-1		18	mg/kg	1.126	20.266	mg/kg	0.00203 %		
8	4	mercury { mercury		7487-94-7		0.13	mg/kg	1.353	0.176	mg/kg	0.0000176 %		
9		nickel { nickel chror		14721-18-7		26	mg/kg	2.976	77.383	mg/kg	0.00774 %		
10	4	selenium { seleniun cadmium sulphosel in this Annex 034-002-00-8				0.44	mg/kg	2.554	1.124	mg/kg	0.000112 %		
11	4	zinc { <mark>zinc chromat</mark> 024-007-00-3	<mark>e</mark> } 236-878-9	13530-65-9		73	mg/kg	2.774	202.513	mg/kg	0.0203 %		
12	0	TPH (C6 to C40) pe	etroleum group	TPH		10	mg/kg		10	mg/kg	0.001 %		
13		benzene 601-020-00-8	200-753-7	71-43-2		0.001	mg/kg		0.001	mg/kg	0.0000001 %		
14		toluene 601-021-00-3	203-625-9	108-88-3		0.001	mg/kg		0.001	mg/kg	0.0000001 %		

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#		Determinand		CLP Note	User entered	d data	Conv. Factor	Compound	conc.	Classification value	Api	Conc. Not Used
		CLP index number EC Number	CAS Number	CL							N N N	
15	8	ethylbenzene			0.001	mg/kg		0.001	mg/kg	0.0000001 %		
		601-023-00-4 202-849-4	100-41-4	_								
16		xylene 601-022-00-9 202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		0.001	mg/kg		0.001	mg/kg	0.0000001 %		
17	4	cyanides { salts of hydrogen cyani exception of complex cyanides such ferricyanides and mercuric oxycyanic specified elsewhere in this Annex }	as ferrocyanides,		17	mg/kg	1.884	32.028	mg/kg	0.0032 %		
\vdash		006-007-00-5		+							$\left \right $	
18	Θ	pH	PH	-	7.6	рН		7.6	рН	7.6 pH		
10		naphthalene		1	0.52	ma/ka		0.50	malka	0 000052 %	\square	
19		601-052-00-2 202-049-5	91-20-3		0.52	mg/kg		0.52	mg/kg	0.000052 %		
20	0	acenaphthylene 205-917-1	208-96-8		1.1	mg/kg		1.1	mg/kg	0.00011 %		
21	0	acenaphthene			0.64	mg/kg		0.64	mg/kg	0.000064 %		
		201-469-6	83-32-9	_								
22	Θ	fluorene 201-695-5	86-73-7	_	1.3	mg/kg		1.3	mg/kg	0.00013 %		
	8	phenanthrene	00707	-								
23	Ŭ	201-581-5	85-01-8	-	5.4	mg/kg		5.4	mg/kg	0.00054 %		
24	8	anthracene			2	mg/kg		2	mg/kg	0.0002 %		
		204-371-1	120-12-7									
25	Θ	fluoranthene			8.3	mg/kg		8.3	mg/kg	0.00083 %		
\square		205-912-4 pyrene	206-44-0	-								
26	Θ	204-927-3	129-00-0	_	8.1	mg/kg		8.1	mg/kg	0.00081 %		
27		benzo[a]anthracene	!		3.6	mg/kg		3.6	mg/kg	0.00036 %		
		601-033-00-9 200-280-6	56-55-3									
28		chrysene			3.6	mg/kg		3.6	mg/kg	0.00036 %		
		601-048-00-0 205-923-4	218-01-9	-							$\left \right $	
29		benzo[b]fluoranthene 601-034-00-4 205-911-9	205-99-2	4	5.8	mg/kg		5.8	mg/kg	0.00058 %		
\vdash		benzo[k]fluoranthene	200-33-2	+							\vdash	
30		601-036-00-5 205-916-6	207-08-9	-	2.3	mg/kg		2.3	mg/kg	0.00023 %		
31		benzo[a]pyrene; benzo[def]chrysene		1	A F	maller		A F	maller	0.00045.84	\square	
31		601-032-00-3 200-028-5	50-32-8		4.5	mg/kg		4.5	mg/kg	0.00045 %		
32	8	indeno[123-cd]pyrene			3.8	mg/kg		3.8	mg/kg	0.00038 %		
		205-893-2	193-39-5	1					59		\square	
33		dibenz[a,h]anthracene 601-041-00-2 200-181-8	53-70-3		0.91	mg/kg		0.91	mg/kg	0.000091 %		
	e	benzo[ghi]perylene	00-70-0	+							\vdash	
34	9	205-883-8	191-24-2		4.1	mg/kg		4.1	mg/kg	0.00041 %		
35		phenol			0.5	mg/kg		0.5	mg/kg	0.00005 %	\square	
33		604-001-00-2 203-632-7	108-95-2	1_	0.0	ing/kg		0.0	iiig/ky	0.00000 //		
36		carbon tetrachloride; tetrachlorometh			0.001	mg/kg		0.001	mg/kg	0.0000001 %		
		602-008-00-5 200-262-8	56-23-5	_								
37		vinyl chloride; chloroethylene 602-023-00-7 200-831-0	75-01-4	-	0.001	mg/kg		0.001	mg/kg	0.0000001 %		
\vdash								<u> </u>	Total:	0.0455 %		

4

User supplied data

Determinand defined or amended by HazWasteOnline (see Appendix A)

Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration



HP 2: Oxidizing "waste which may, generally by providing oxygen, cause or contribute to the combustion of other materials" Force this Hazardous property to non hazardous because At limit of detection.

Hazard Statements hit:

Ox. Sol. 1; H271 "May cause fire or explosion; strong oxidiser."

Because of determinand:

chromium(VI) oxide: (compound conc.: 0.00009%)

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because At limit of detection.

Hazard Statements hit:

Flam. Liq. 2; H225 "Highly flammable liquid and vapour."

Because of determinands: benzene: (conc.: 1.0e-07%) toluene: (conc.: 1.0e-07%) ethylbenzene: (conc.: 1.0e-07%)

Flam. Lig. 3; H226 "Flammable liquid and vapour."

Because of determinands:

TPH (C6 to C40) petroleum group: (conc.: 0.001%) xylene: (conc.: 1.0e-07%)

HP 3(iv): Flammable "flammable gaseous waste: gaseous waste which is flammable in air at 20°C and a standard pressure of 101.3 kPa"

Force this Hazardous property to non hazardous because At limit of detection.

Hazard Statements hit:

Flam. Gas 1; H220 "Extremely flammable gas."

Because of determinand:





Sample details

Sample Name:	LoW Code:	
HP03	Chapter:	17: Construction and Demolition Wastes (including excavated soi
Sample Depth:		from contaminated sites)
0.4 m	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05
Moisture content:		03)
10%		
(no correction)		

Hazard properties

None identified

Determinands

Moisture content: 10% No Moisture Correction applied (MC)

#		CLP index number EC Number CAS Number	CLP Note	User entered	data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	4	arsenic { arsenic trioxide }		6.6	mg/kg	1.32	8.714 mg/kg	0.000871 %		
2	4	beryllium { beryllium oxide } 004-003-00-8 215-133-1 1304-56-9		1	mg/kg	2.775	2.775 mg/kg	0.000278 %		
3	4	boron { diboron trioxide; boric oxide } 005-008-00-8 215-125-8 1303-86-2		0.4	mg/kg	3.22	1.288 mg/kg	0.000129 %		
4	4	cadmium { cadmium oxide } 048-002-00-0 215-146-2 1306-19-0		0.12	mg/kg	1.142	0.137 mg/kg	0.0000137 %		
5	4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) } 215-160-9 1308-38-9		19	mg/kg	1.462	27.77 mg/kg	0.00278 %		
6	4	chromium in chromium(VI) compounds {		0.5	mg/kg	1.923	0.962 mg/kg	0.0000962 %		
7	4	024-001-00-0 215-607-8 1333-82-0 copper { dicopper oxide; copper (I) oxide } 029-002-00-X 215-270-7 1317-39-1		14	mg/kg	1.126	15.762 mg/kg	0.00158 %		
8	4	029-002-00-X 215-270-7 1317-39-1 mercury { mercury dichloride } 080-010-00-X 231-299-8 7487-94-7		0.1	mg/kg	1.353	0.135 mg/kg	0.0000135 %		
9	4	nickel { nickel chromate } 028-035-00-7 238-766-5 14721-18-7		21	mg/kg	2.976	62.502 mg/kg	0.00625 %		
10	4	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } 034-002-00-8	_	0.53	mg/kg	2.554	1.353 mg/kg	0.000135 %		
11		zinc { zinc chromate } 024-007-00-3 236-878-9 13530-65-9		55	mg/kg	2.774	152.578 mg/kg	0.0153 %		
12	8	TPH (C6 to C40) petroleum group		10	mg/kg		10 mg/kg	0.001 %		
13		benzene 601-020-00-8 200-753-7 71-43-2		0.001	mg/kg		0.001 mg/kg	0.0000001 %		
14		toluene 601-021-00-3 203-625-9 108-88-3		0.001	mg/kg		0.001 mg/kg	0.0000001 %		



#		Determinand		CLP Note	User entered	d data	Conv. Factor	Compound	conc.	Classification value	MC Applied	Conc. Not Used	
		CLP index number	EC Number	CAS Number	CLP			. doto:				AC /	0000
15	8	ethylbenzene 601-023-00-4	202-849-4	100-41-4		0.001	mg/kg		0.001	mg/kg	0.0000001 %		
		xylene											
16		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		0.001	mg/kg		0.001	mg/kg	0.0000001 %		
17	4	exception of compl ferricyanides and n specified elsewhere	of hydrogen cyanid ex cyanides such a nercuric oxycyanide e in this Annex }	s ferrocyanides,		12	mg/kg	1.884	22.608	mg/kg	0.00226 %		
		006-007-00-5											
18	Θ	pH		PH		7.1	pН		7.1	pН	7.1 pH		
19		naphthalene	000 040 5	01 20 2		0.58	mg/kg		0.58	mg/kg	0.000058 %		
20	۲	601-052-00-2 acenaphthylene	202-049-5	91-20-3		0.81	mg/kg		0.81	mg/kg	0.000081 %		
		1	205-917-1	208-96-8]								
21	۲	acenaphthene	201-469-6	83-32-9		0.55	mg/kg		0.55	mg/kg	0.000055 %		
22	8	fluorene	201-695-5	86-73-7		1	mg/kg		1	mg/kg	0.0001 %		
00		phenanthrene	201 000 0	00101		4.0			4.0		0.00040.%		
23			201-581-5	85-01-8		4.2	mg/kg		4.2	mg/kg	0.00042 %		
24	Θ	anthracene	204-371-1	120-12-7		1.4	mg/kg		1.4	mg/kg	0.00014 %		
25	0	fluoranthene				5.4	mg/kg		5.4	mg/kg	0.00054 %		
26	0	pyrene	205-912-4	206-44-0		5.1	mg/kg		5.1	mg/kg	0.00051 %		
07		benzo[a]anthracen	204-927-3 e	129-00-0	-	0.4			0.4		0.00001.0/		
27		601-033-00-9	200-280-6	56-55-3		2.1	mg/kg		2.1	mg/kg	0.00021 %		
28		chrysene 601-048-00-0	205-923-4	218-01-9		2	mg/kg		2	mg/kg	0.0002 %		
		benzo[b]fluoranthe		210-01-3		0.0					0.00000.0/		
29		601-034-00-4	205-911-9	205-99-2		3.2	mg/kg		3.2	mg/kg	0.00032 %		
30		benzo[k]fluoranthe 601-036-00-5	ne 205-916-6	207-08-9		1.3	mg/kg		1.3	mg/kg	0.00013 %		
31		benzo[a]pyrene; be		F01-00-3	┢	2.1	mg/kg		2.1	mg/kg	0.00021 %		<u> </u>
			200-028-5	50-32-8	1								
32	•	indeno[123-cd]pyre	ene 205-893-2	193-39-5		1.9	mg/kg		1.9	mg/kg	0.00019 %		
33		dibenz[a,h]anthrac 601-041-00-2	ene 200-181-8	53-70-3		0.57	mg/kg		0.57	mg/kg	0.000057 %		
34	۲	benzo[ghi]perylene	9			2.2	mg/kg		2.2	mg/kg	0.00022 %		<u> </u>
		phenol	205-883-8	191-24-2									
35		604-001-00-2	203-632-7	108-95-2		0.5	mg/kg		0.5	mg/kg	0.00005 %		
36		carbon tetrachlorid	e; tetrachlorometha	ne		0.001	mg/kg		0.001	mg/kg	0.0000001 %		
		602-008-00-5 vinyl chloride; chlor	200-262-8 roethylene	56-23-5	+								
37		602-023-00-7	200-831-0	75-01-4		0.001	mg/kg		0.001	mg/kg	0.0000001 %		
										Total:	0.0342 %		

User supplied data

Determinand defined or amended by HazWasteOnline (see Appendix A)

Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration



HP 2: Oxidizing "waste which may, generally by providing oxygen, cause or contribute to the combustion of other materials" Force this Hazardous property to non hazardous because At limit of detection.

Hazard Statements hit:

Ox. Sol. 1; H271 "May cause fire or explosion; strong oxidiser."

Because of determinand:

chromium(VI) oxide: (compound conc.: 0.00009%)

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because At limit of detection.

Hazard Statements hit:

Flam. Liq. 2; H225 "Highly flammable liquid and vapour."

Because of determinands: benzene: (conc.: 1.0e-07%) toluene: (conc.: 1.0e-07%) ethylbenzene: (conc.: 1.0e-07%)

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinands:

TPH (C6 to C40) petroleum group: (conc.: 0.001%) xylene: (conc.: 1.0e-07%)

<u>HP 3(iv): Flammable</u> "flammable gaseous waste: gaseous waste which is flammable in air at 20°C and a standard pressure of 101.3 kPa"

Force this Hazardous property to non hazardous because At limit of detection.

Hazard Statements hit:

Flam. Gas 1; H220 "Extremely flammable gas."

Because of determinand:



Non Hazardous Waste Classified as 17 05 04 in the List of Waste	
---	--

Sample details

Sample Name: HP05 Sample Depth:	LoW Code: Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.8 m	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05
Moisture content:		03)
12%		
(no correction)		

Hazard properties

None identified

Determinands

Moisture content: 12% No Moisture Correction applied (MC)

#	CLP index number	Determinand EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	pН		PH		7.4	рН		7.4	рН	7.4 pH		
						Total:	0%					

Key

User supplied data

Determinand defined or amended by HazWasteOnline (see Appendix A)





Sample details

Sample Name:	LoW Code:	
HP01	Chapter:	17: Construction and Demolition Wastes (including excavated soi
Sample Depth:		from contaminated sites)
0.5 m	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05
Moisture content:		03)
11%		
(no correction)		

Hazard properties

None identified

Determinands

Moisture content: 11% No Moisture Correction applied (MC)

#		CLP index number	Determinand EC Number	CAS Number	CLP Note	User entered data	Conv. Factor			Classification value	MC Applied	Conc. Not Used
1	0	рН		PH		7.3 pH		7.3	pН	7.3 pH		
									Total:	0%		

Key

- User supplied data
- Determinand defined or amended by HazWasteOnline (see Appendix A)



. Non Hazardous Waste Classified as 17 05 04 in the List of Waste

Sample details

Sample Name: HP18		17: Construction and Demolition Wastes (including excavated soil
Sample Depth:		from contaminated sites)
1.0 m	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05
Moisture content:		03)
13%		
(no correction)		

Hazard properties

None identified

Determinands

Moisture content: 13% No Moisture Correction applied (MC)

#	CLP index number	Determinand EC Number	CAS Number	LP Note			Conv. Factor			Classification value	C Applied	Conc. Not Used
	pH	Lo Humbor		<u>г</u>	7.0 al			7.0		7.3 pH	Ŭ	
			PH		7.3 pł			7.3	pH Total:	7.3 рн 0%		

Key

User supplied data

Determinand defined or amended by HazWasteOnline (see Appendix A)





Sample details

Sample Name:	LoW Code:	
HP05[2]	Chapter:	17: Construction and Demolition Wastes (including excavated soil
Sample Depth:		from contaminated sites)
0.3 m	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05
Moisture content:		03)
9.1%		
(no correction)		

Hazard properties

None identified

Determinands

Moisture content: 9.1% No Moisture Correction applied (MC)

#		CLP index number	Determinand EC Number	CAS Number	CLP Note			Conv. Factor			Classification value	AC Applied	Conc. Not Used
1	٥	рН		PH		6.9	рН		6.9	рН	6.9 pH		
	1			[Total:	0%		

Key

- User supplied data
- Determinand defined or amended by HazWasteOnline (see Appendix A)



Appendix A: Classifier defined and non CLP determinands

• chromium(III) oxide (worst case) (EC Number: 215-160-9, CAS Number: 1308-38-9)

Conversion factor: 1.462 Description/Comments: Data from C&L Inventory Database Data source: https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/33806 Data source date: 17 Jul 2015 Hazard Statements: Acute Tox. 4 H332, Acute Tox. 4 H302, Eye Irrit. 2 H319, STOT SE 3 H335, Skin Irrit. 2 H315, Resp. Sens. 1 H334, Skin Sens. 1 H317, Repr. 1B H360FD, Aquatic Acute 1 H400, Aquatic Chronic 1 H410

TPH (C6 to C40) petroleum group (CAS Number: TPH)

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013 Data source: WM3 1st Edition 2015 Data source date: 25 May 2015 Hazard Statements: Flam. Liq. 3 H226, Asp. Tox. 1 H304, STOT RE 2 H373, Muta. 1B H340, Carc. 1B H350, Repr. 2 H361d, Aquatic Chronic 2 H411

• ethylbenzene (EC Number: 202-849-4, CAS Number: 100-41-4)

CLP index number: 601-023-00-4

Description/Comments:

Data source: Commission Regulation (EU) No 605/2014 – 6th Adaptation to Technical Progress for Regulation (EC) No 1272/2008. (ATP6)

Additional Hazard Statement(s): Carc. 2 H351 Reason for additional Hazards Statement(s):

03 Jun 2015 - Carc. 2 H351 hazard statement sourced from: IARC Group 2B (77) 2000

• salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex

CLP index number: 006-007-00-5 Description/Comments: Conversion factor based on a worst case compound: sodium cyanide Data source: Commission Regulation (EC) No 790/2009 - 1st Adaptation to Technical Progress for Regulation (EC) No 1272/2008. (ATP1) Additional Hazard Statement(s): EUH032 >= 0.2 % Reason for additional Hazards Statement(s):

14 Dec 2015 - EUH032 >= 0.2 % hazard statement sourced from: WM3, Table C12.2

• pH (CAS Number: PH) Description/Comments: Appendix C4 Data source: WM3 1st Edition 2015 Data source date: 25 May 2015 Hazard Statements: None.

acenaphthylene (EC Number: 205-917-1, CAS Number: 208-96-8)
 Description/Comments: Data from C&L Inventory Database
 Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
 Data source date: 17 Jul 2015
 Hazard Statements: Acute Tox. 4 H302 , Acute Tox. 1 H330 , Acute Tox. 1 H310 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Skin Irrit. 2 H315

acenaphthene (EC Number: 201-469-6, CAS Number: 83-32-9)

Description/Comments: Data from C&L Inventory Database Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database Data source date: 17 Jul 2015 Hazard Statements: Eye Irrit. 2 H319 , STOT SE 3 H335 , Skin Irrit. 2 H315 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410 , Aquatic Chronic 2 H411

[®] fluorene (EC Number: 201-695-5, CAS Number: 86-73-7)

Description/Comments: Data from C&L Inventory Database Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database Data source date: 06 Aug 2015 Hazard Statements: Aquatic Acute 1 H400, Aquatic Chronic 1 H410



• phenanthrene (EC Number: 201-581-5, CAS Number: 85-01-8) Description/Comments: Data from C&L Inventory Database Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database Data source date: 06 Aug 2015 Hazard Statements: Acute Tox. 4 H302 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Carc. 2 H351 , Skin Sens. 1 H317 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410, Skin Irrit. 2 H315 anthracene (EC Number: 204-371-1, CAS Number: 120-12-7) Description/Comments: Data from C&L Inventory Database Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database Data source date: 17 Jul 2015 Hazard Statements: Eve Irrit. 2 H319, STOT SE 3 H335, Skin Irrit. 2 H315, Skin Sens. 1 H317, Aquatic Acute 1 H400, Aquatic Chronic 1 H410 • fluoranthene (EC Number: 205-912-4, CAS Number: 206-44-0) Description/Comments: Data from C&L Inventory Database Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database Data source date: 21 Aug 2015 Hazard Statements: Acute Tox. 4 H302, Aquatic Acute 1 H400, Aquatic Chronic 1 H410 • pyrene (EC Number: 204-927-3, CAS Number: 129-00-0) Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014 Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database Data source date: 21 Aug 2015 Hazard Statements: Skin Irrit. 2 H315, Eve Irrit. 2 H319, STOT SE 3 H335, Aquatic Acute 1 H400, Aquatic Chronic 1 H410

• indeno[123-cd]pyrene (EC Number: 205-893-2, CAS Number: 193-39-5)

Description/Comments: Data from C&L Inventory Database Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database Data source date: 06 Aug 2015 Hazard Statements: Carc. 2 H351

benzo[ghi]perylene (EC Number: 205-883-8, CAS Number: 191-24-2)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 28/02/2015 Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database Data source date: 23 Jul 2015

Hazard Statements: Aquatic Acute 1 H400, Aquatic Chronic 1 H410

Appendix B: Rationale for selection of metal species

arsenic {arsenic trioxide}

Reasonable case CLP species based on hazard statements/molecular weight and most common (stable) oxide of arsenic. Industrial sources include: smelting; main precursor to other arsenic compounds (edit as required)

beryllium {beryllium oxide}

Reasonable case CLP species based on hazard statements/molecular weight. Industrial sources include: most common (non alloy) form, used in ceramics (edit as required)

boron {diboron trioxide; boric oxide}

Reasonable case CLP species based on hazard statements/ molecular weight, physical form and low solubility. Industrial sources include: fluxing agent for glass/enamels; additive for fibre optics, borosilicate glass (edit as required)

cadmium {cadmium oxide}

Reasonable case CLP species based on hazard statements/molecular weight, very low solubility in water. Industrial sources include: electroplating baths, electrodes for storage batteries, catalysts, ceramic glazes, phosphors, pigments and nematocides. (edit as required) Worst case compounds in CLP: cadmium sulphate, chloride, fluoride & iodide not expected as either very soluble and/or compound's industrial usage not related to site history (edit as required)

chromium in chromium(III) compounds {chromium(III) oxide (worst case)}

Reasonable case species based on hazard statements/molecular weight. Industrial sources include: tanning, pigment in paint, inks and glass (edit as required)

chromium in chromium(VI) compounds {chromium(VI) oxide}

Worst case CLP species based on hazard statements/molecular weight. Industrial sources include: production stainless steel, electroplating, wood preservation, anti-corrosion agents or coatings, pigments (edit as required)



copper {dicopper oxide; copper (I) oxide}

Reasonable case CLP species based on hazard statements/molecular weight and insolubility in water. Industrial sources include: oxidised copper metal, brake pads, pigments, antifouling paints, fungicide. (edit as required) Worse case copper sulphate is very soluble and likely to have been leached away if ever present and/or not enough soluble sulphate detected. (edit as required)

mercury {mercury dichloride}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

nickel {nickel chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

selenium (selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex)

Harmonised group entry used as most reasonable case. Pigment cadmium sulphoselenide not likely to be present in this soil. No evidence for the other CLP entries: sodium selenite, nickel II selenite and nickel selenide, to be present in this soil. (edit as required)

zinc {zinc chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

cyanides {salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex}

Harmonised group entry used as most reasonable case as complex cyanides and those specified elsewhere in the annex are not likely to be present in this soil: [Note conversion factor based on a worst case compound: sodium cyanide] (edit as required)

Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.1, May 2018 HazWasteOnline Classification Engine Version: 2020.241.4455.8692 (28 Aug 2020) HazWasteOnline Database: 2020.241.4455.8692 (28 Aug 2020)

This classification utilises the following guidance and legislation: WM3 v1.1 - Waste Classification - 1st Edition v1.1 - May 2018 CLP Regulation - Regulation 1272/2008/EC of 16 December 2008 1st ATP - Regulation 790/2009/EC of 10 August 2009 2nd ATP - Regulation 286/2011/EC of 10 March 2011 3rd ATP - Regulation 618/2012/EU of 10 July 2012 4th ATP - Regulation 487/2013/EU of 8 May 2013 Correction to 1st ATP - Regulation 758/2013/EU of 7 August 2013 5th ATP - Regulation 944/2013/EU of 2 October 2013 6th ATP - Regulation 605/2014/EU of 5 June 2014 WFD Annex III replacement - Regulation 1357/2014/EU of 18 December 2014 Revised List of Wastes 2014 - Decision 2014/955/EU of 18 December 2014 7th ATP - Regulation 2015/1221/EU of 24 July 2015 8th ATP - Regulation (EU) 2016/918 of 19 May 2016 9th ATP - Regulation (EU) 2016/1179 of 19 July 2016 10th ATP - Regulation (EU) 2017/776 of 4 May 2017 HP14 amendment - Regulation (EU) 2017/997 of 8 June 2017 13th ATP - Regulation (EU) 2018/1480 of 4 October 2018 14th ATP - Regulation (EU) 2020/217 of 4 October 2019 POPs Regulation 2004 - Regulation 850/2004/EC of 29 April 2004 1st ATP to POPs Regulation - Regulation 756/2010/EU of 24 August 2010 2nd ATP to POPs Regulation - Regulation 757/2010/EU of 24 August 2010

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